

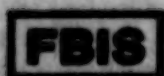
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USSR Report

CONSTRUCTION AND EQUIPMENT

No. 7



FOREIGN BROADCAST INFORMATION SERVICE

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CONSTRUCTION

FINANCIAL, CREDIT ASPECTS OF CONSTRUCTION INDUSTRY

Stroybank-Gosbank Funds

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 31 Jan 80 p 2

[Article: "Accounts for a Project"]

[Text] The USSR Minfin [Ministry of Finance], USSR Stroybank [All-Union Bank for the Financing of Capital Investments] and USSR Gosbank, by agreement with USSR Gosplan, USSR Gosstroy and the USSR CSA adopted the directive entitled "Procedures for the Utilization by USSR Stroybank and USSR Gosbank of Funds Made Available by Clients in Connection With Converting Over To Accounts Without Intermediate Payments, in the Form of Resources for the Issuing of Credit To Contractual and Planning-Research Organizations, for Covering Expenses Associated With the Unfinished Production of Construction-Installation and Planning-Research Work."

It is pointed out in this document that the ministries and departments of the USSR and the councils of ministers of the union republics are obligated, commencing in 1981, to complete the introduction of accounts between the clients and contractors for facilities that have been fully completed and turned over for operation, either for the production of goods or the rendering of services: enterprises, start-up complexes, phases and projects. The accounts must be carried out on the basis of the estimated cost of the completed construction, while taking into account the payments made to contracting organizations for additional expenses and compensation.

Funds will not be advanced for work not completed by the contracting and planning-research organizations. Their expenses for carrying out this work will be financed by means of credit advanced by Stroybank and USSR Gosbank. The source -- funds made available by the clients in connection with converting over to accounts without intermediate payments.

For the extension of credit for unfinished work, the client must transfer the funds called for in the plan for financing capital investments over to special accounts opened for him in local branches of the banks. The funds

for these accounts are transferred in those instances when the capital investments are financed by means of long-term credit.

If a client temporarily lacks funds in his capital investment account, Stroybank or USSR Gosbank will extend credit to him. It must be repaid within 45 days. The repayment conditions are established in the 28 May 1969 decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Improvements in the Planning of Capital Construction and Increasing Economic Stimulation in Construction Production."

When the accounts of the client and contractor are located in different banks (for example, the account of the client in Gosbank and that of the contractor in Stroybank), then one of them reports to the other concerning the total amount of funds released by the client and transferred to a special account. These funds are also used as resources for extending credit to construction organizations for "unfinished work." The schedules and procedures for using them are regulated by joint directives handed down by the administrations of Gosbank and USSR Stroybank, by agreement with USSR Minfin.

The frequency of transfers to special accounts (every 10 days, monthly or quarterly) is established by the banks by agreement with the clients. If the client does not transfer his funds within the established period, appropriate amounts are deducted from his account. Responsibility for the timely transferring of funds is borne not only by the clients but also by their ministries.

The indebtedness of the contracting organizations to the clients and that of sub-contracting organizations to the general contractors, for former advances, is re-formulated into indebtedness to the bank. In those instances where the volume of unfinished work is greater than the total amount of advances issued earlier, the client must transfer additional funds to his contractor. If he lacks the funds for doing so, then Stroybank or Gosbank will extend credit to him which must be repaid within the current year.

This method for using the funds of clients for extending credit to planning, contracting and sub-contracting organizations for unfinished construction-installation and planning-research work is used independently of sources available for the financing of capital investments.

Economic 'Experiment'

Moscow FINANSY SSSR in Russian No 1, Jan 80 pp 23-27

[Article by B.M. Lisitsyn, deputy manager of the Ukrainian office of USSR Stroybank: "Problems of an Economic Experiment"]

[Text] An economic experiment is being carried out in Mintyazhstroy [Ministry of Construction of Heavy Industry Establishments] and

Minmontazhspetsstroy for the Ukrainian SSR in connection with further improving the planning of construction production and raising the role played by economic methods in operations. In 1978, a conversion was carried out over to planning contractual work based upon the index for marketable construction output; accounts were introduced for construction-installation work carried out, by enterprises turned over for operations following the completion of construction (projects of a non-productive nature), start-up complexes, phases and projects, prepared to produce products (render services); the extension of credit was introduced for covering the expenses for unfinished production of construction-installation work right up until actual delivery; a portion of the unrealized profit was used by the ministry for covering planned expenses and for expending material incentive funds in amounts not covered by balance profits.

Other measures -- planning and distribution of profit based upon deduction norms at the disposal of the ministry; creation of a common fund for scientific and engineering development; expanding the economic independence of the ministry with regard to improving the organizational structure and staffs; ensuring the availability of material-technical resources for the work programs, based upon the requirements determined in accordance with the plans and estimates; centralization in the trusts of the functional services of their subordinate construction-installation organizations; issuing of funds for wages as the plan for marketable output is fulfilled -- will be carried out gradually in accordance with the schedules established by the interdepartmental committee of USSR Gosplan, upon presentation of USSR Mintyazhstroy and the Council of Ministers for the Ukrainian SSR.

The Ukrainian office of Stroybank [All-Union Bank for the Financing of Capital Investments] carried out a number of measures associated with the experiment. The temporary funds (advances) obtained earlier by the contracting organizations of Mintyazhstroy and Minmontazhspetsstroy for the Ukrainian SSR from the clients, for covering the expenditures for unfinished production, were reformulated into credit in a timely manner; the basic operational principles under the new conditions were clarified during instructional meetings and seminars; the necessary methodological documents associated with the introduction of accounts for finished construction products were prepared; the transfer of funds of clients to special accounts, for their use as credit resources, was organized; the issuing of credit for marketable output and unfinished production was established.

A great amount of preparatory work was carried out by the ministries. At the beginning of the experiment, all of the construction organizations and industrial and transport enterprises were converted over to the new conditions for planning and economic stimulation, the level of completely prefabricated construction was raised and consolidated accounts were introduced for construction-installation work carried out, for motor transport services and for sets of designs. Measures were undertaken to improve annual and long-range operational-production planning and a system of engineering training was introduced. In all of the construction

combines, trusts and administrations, the leading workers, it's [engineering and technical personnel] and workers attached to economic services studied the conditions of the experiment and the normative documents. Based upon the intra-building title lists, a plan for marketable construction output was examined and approved for 1978-1979.

A comparison of the principal technical-economic indices of the ministries for 1978 reveals a certain amount of improvement compared to the previous year. An improvement was realized in carrying out the plan for placing production capabilities, projects and housing units in operation and the plan for introducing childrens' pre-school institutes, professional-technical schools and general educational schools into operations was also fulfilled. A reduction was achieved in the number of organizations which did not fulfill their work plan using their own resources or the tasks for raising labor productivity, the savings plan was fulfilled to a better degree and unproductive expenditures were lowered.

A positive result of the experiment was the extensive introduction of credit, which under the new conditions has become a principal source for forming the working capital of contractual organizations and for covering expenditures for the unfinished production of construction-installation work. At the end of the year, 93.9 percent of all expenditures for unfinished construction-installation work was covered by means of credit compared to 22 percent for the previous year and the proportion of credit in the working capital of contracting organizations increased during this period from 12 to 74 percent. The replacement of free advances by clients for unfinished production expenditures by bank credit with differentiated percentage rates promoted a more rational organization for working capital, it excluded the presence in circulation of excess funds and it forced the builders and contractors into observing in a more strict manner the schedules established for the delivery of projects and achieving the best results in raising the effectiveness of investments.

An analysis of the duration of construction of projects reveals that in 1978 a number of organizations achieved reductions in their construction schedules. For example, at the Dneprogorstroy Trust of the Dneprotyazhstroy Combine, projects were erected 1.4 months more rapidly than was the case the previous year. At the Dneprometallurgstroy Combine, the average construction period for 40 percent of the projects placed in operation was 12 months compared to a norm of 16 months; last year the average period of construction exceeded the norm by 31 percent.

However, in many instances the actual periods of construction are still exceeding the norm periods. In the case of five projects of a production nature, introduced into operations by the Zhdanovstroy Combine, the construction periods reached 29 months compared to a norm of 15 months. The average construction periods for projects placed in operation by the Kirovogradtyazhstroy Combine amounted to 30 months instead of 29. The Shakhterskzhilstroy Trust failed to observe the norm for the duration of construction in the case of 12 projects which it turned over for operation.

Experience has shown that the banking institutions experienced great difficulties in providing resources for issuing credit in behalf of unfinished production expenditures. For these reasons and on individual dates, credit was issued over and above the sources and there were instances of interruptions in the extension of credit. It was not until the end of the year that the banking institutions were able to ensure the resources required for the credit extended. At the end of the year the funds remaining in special accounts exceeded the loan indebtedness for unfinished production expenditures by more than 10 million rubles. As yet there is no established method for reflecting such funds in the financial plans.

Many clients are constantly violating the instructions handed down by USSR Minfin and the CSA concerning the schedules for transferring funds to special accounts. The timely accumulation of funds, released in connection with the introduction of accounts for finished construction output, has not become a direct responsibility of the clients and is being carried out mainly on the basis of compulsory instructions issued by the banking institutions.

At the present time, a client does not sustain material damage if continuity in the extension of credit is disrupted. Thus, attention should be focused on the problem of raising the economic responsibility of construction projects and organizations (clients) for ensuring the availability of funds for capital construction and, in particular, on their payment of fines for the untimely transfer to special accounts of withdrawn and accumulated funds and also on the payment of percentages for credit in behalf of internal capital not introduced in accordance with the plan, in percentage rates for credit for working capital. The fines and percentages must apply to the results of the principal activities or to the accounts of the ministries and departments, according to the reserve account for the furnishing of temporary financial assistance.

In addition and for the purpose of ensuring the uninterrupted extension of credit to contractual organizations, for expenses associated with unfinished construction-installation work, an examination should also be undertaken of the extension of credit for such expenses, when there are insufficient resources reserved for the specific clients, with use being made of general credit resources of USSR Srobybank or a specially created reserve.

It is our opinion that contractual organizations which converted over to the experiment must have timely and guaranteed payments for finished marketable construction output and for an increase in unfinished production. This will facilitate the carrying out of the experiment, reduce the losses of the contractual organizations and strengthen financial discipline. In connection with the unstable issuing of credit for unfinished production expenditures, organizations of the ministry, in addition, lost approximately 500,000 rubles that were not included in the plan. Prior to the experiment, such expenditures, as is well known, were compensated by the clients in the

form of fines for untimely payment of accounts upon the completion of construction-installation work. Such compensation is lacking at the present time. In addition, with the conversion over to the new conditions for extending credit for unfinished production, a regular reduction took place in the flow of funds by means of payment credits and this is also limiting the financial maneuverability of the contractual organizations.

During the carrying out of the experiment, marketable output serves as the principal index. It reflects the placing in operation of enterprises, capabilities, complexes and projects, prepared for the production of goods or the rendering of services. Despite the fact that a greater number of production capabilities and projects were placed in operation in 1978 and the relative index was higher by 24 points than that for 1977, the plan for the start-up program was underfulfilled and 32 production capabilities were not placed in operation. This exerted an adverse effect on the principal index of construction production. The plan for completed marketable output turned out to be underfulfilled and the level of its fulfillment by Mintyazhstroy organizations was 15 points lower and that for Minmontazhspetsstroy 35 points lower than fulfillment of the computed index (gross volume). The distribution of the marketable construction output, according to the plan and actual fulfillment by quarters, is furnished below:

1978 (quarters)	Mintyazhstroy for Ukrainian SSR		Minmontazhspetsstroy for Ukrainian SSR	
	Plan for annual volume of marketable output	Actual	Plan for annual volume of marketable output	Actual
	100	100	100	100
I	6.0	31.9	17	20
II	24.2		20	21
III	20.3	20.6	22	23
IV	49.5	47.5	41	36

Thus, a rhythmic pace in fulfilling the plan for marketable output and for placing production capabilities in operation was not achieved in 1978. This is explained not only by a certain lack of preparation on the part of the lower and middle echelons of builders, but also by the very important fact that the "gross" and computed index for the volume of work carried out is still valued higher than the index for the volume of marketable output, since up until now it has been used for determining the value of the wage fund, with a savings or over-expenditure of the fund being dependent upon it. An acceleration should take place in the introduction of a method by means of which the issuing of funds for wages would be carried out as the plan for marketable output and increased unfinished production was fulfilled within the limits of the norms, although under these conditions the problem of a payment during periods marked by an absence of marketable output would arise.

During the first year, the objective and subjective circumstances restricted and even delayed the carrying out of the experiment. For Minmontazhspestroy, the methodological instructions for further improving the planning for production-economic activity were approved only on 31 August 1978 and the plan for marketable output was made available to the main administrations at the end of the year. Thus the plan and the actual fulfillment by organizations of this ministry were, to a certain extent, conditional in nature. For all practical purposes, the activity of organizations of the ministry is evaluated based upon the former system of indices.

The carrying out of the experiment in Mintyazhstroy was also hindered by the delays which took place in obtaining approval for individual documents, the purpose of which was to regulate operations under the new conditions. The methodological instructions were approved on 16 March 1978 and made available to the various areas in April. The list of construction projects marked by an extended duration of construction work, for which the MVK [inter-departmental committee] of USSR Gosplan considered it inadvisable to settle accounts for work carried out, fully completed enterprises, start-up complexes, phases and projects was determined in February and the temporary instruction on the method for determining the structure and estimated cost of construction-installation work for enlarged technological cycles was approved on 1 September.

The enlarged technological cycle for projects marked by an extended duration of construction work, erected on the basis of the unit method for organizing construction, appears as a complex of completed construction-installation operations, in the technological sequence called for in the approved schedule. Only those operations which are called for in the network graph and which are completed in a given quarter, regardless of the period in which their work commenced, are included in the enlarged technological cycle. Gosstroy, Stroybank and USSR Mintyazhstroy recommended that 20 construction projects be converted over to a system of accounts by cycles. Actually, Mintyazhstroy for the Ukrainian SSR was not prepared for such accounts. Enlarged technological cycles had not been developed and the volumes of marketable construction output were determined for some construction projects based upon the accounts for trusts in conformity with the overall method. In a number of instances, the construction-installation work carried out was not included in the volume of marketable output.

The introduction of accounts for construction-installation work carried out according to enlarged technological cycles, in close interrelationship with the network graph, can be a positive action only if a construction project is supplied with labor and material-technical resources in a timely manner and the weekly and daily plans are carried out. Just as soon as the construction rhythm becomes disrupted and the accounts disorganized (if the initial cycle has not been completed, payments cannot be made for subsequent ones), an increase takes place in the percentage rate for credit and a reduction occurs in the contributions made to the funds for economic stimulation.

In addition, the preparation of documentation has become more complicated. The trusts of Orgtekhstroy must prepare a record of the work volumes, with information furnished on the buildings, installations and types, the nomenclature of the network graph, the matrix for the work indices of the graph and, finally, an account record of the volume of work according to enlarged technological cycles, with marketable construction output furnished by quarters of the year. Marketable construction output by cycles appears, for all practical purposes, as the volume of construction-installation work which, carried out during the course of a quarter, does not have use value. Nor is it considered advisable to expand this system. Mintyazhstroy took into account the proposals made by the Ukrainian office of USSR Stroybank and, for 1979, only seven construction projects were included on the list of construction projects for the introduction of accounts for technological cycles.

The bank institutions analyzed the structure of marketable construction output at 12 combines of Mintyazhstroy. In a number of instances, deviations from the established method were tolerated. The contractual organizations agreed upon 13 construction projects, as called for in the intra-building title lists for placing production capabilities in operation, however marketable construction output was not planned here. Its indices, in the plans of the contractual organizations, often differed to a considerable degree from the indices for volume of marketable output, in accordance with the intra-building title lists. On the basis of checks carried out on 32 organizations, the volumes of marketable construction output were 10.9 million rubles greater than similar indices for clients and in the case of 138 construction projects -- 117.8 million rubles less.

Proposals were introduced for establishing realistic volumes for marketable construction output and this made it possible to eliminate partially the disparity. The marketable output should ideally take into account the entire volume of capital investments, including equipment, devices and technology and with the cost of the construction-installation work being defined. This would conform with the goal of the experiment -- to introduce into operations enterprises, capabilities and projects which are prepared to produce output (or render services) and interest the clients and contractors in completing their work at a construction project as rapidly as possible.

In 1979, for the purpose of checking upon the correctness of planning for the volume of marketable construction output, the Ukrainian office of USSR Stroybank developed a special program taking into account the 1978 experiment. The program called for an entire complex of questions concerned with the planning of this index in accordance with the intra-building title lists of the builders and contractual organizations. But it was not until the end of May 1979 that USSR Mintyazhstroy approved the program for marketable construction output for Mintyazhstroy for the Ukrainian SSR. It will be difficult to eliminate the shortcomings established by the checks.

In carrying out the experiment, a great amount of attention is being given to the timely formulation of financial arrangements -- presentation to the

bank of all of the required planning and planning-estimates documentation -- and to the correctness of the planned sources of financing, sources which ensure the timely transfer of funds to a special account. The role being played by the institutes of Stroybank is being raised. The offices and branches must promote the rapid opening of financial arrangements, examine without delay the documentation presented by the clients and achieve fulfillment of the plan for financing capital investments.

The prolonged and complicated process of coordinating the volume of marketable output between the clients and contractors is not stimulating the successful carrying out of the experiment, since a delay of 4-5 months is occurring and, as well, the fulfillment of the organizational-technical measures developed for start-up projects and construction projects is for all practical purposes being restrained. This is complicated owing to the fact that the two year plan for placing production capabilities in operation was not developed by the ministry-clients, continuous planning was for all practical purposes not introduced and the five-year plan, with a distribution of tasks by years, has still not become the basis for planning the production-economic activities of construction organizations. Thus, Mintyazhstroy has been unable to raise the quality of the plans as developed or to utilize the rights extended by the experiment during this stage. The principal index under the conditions of the economic experiment -- marketable construction output -- during both 1978 and 1979, was formed following the approval and delivery to the various areas of the plans for capital construction. Technical documentation is often lacking for the start-up complexes, the schedules for the delivery and placing in operation of equipment are not coordinated and sufficient capital investments and funds are not being made available for the start-up construction projects.

In a number of instances, during the planning stage, the required concentration of resources is not being ensured for the construction of the more important production capabilities and projects. The maximum volume of contractual work carried out by the Gorlovskkhimstroy Trust in recent years has not exceeded 26.5 million rubles and in order to ensure the placing in operation of capabilities at the Gorlovka Stirol Production Association, a volume of work in excess of 30 million rubles must be carried out. To the detriment of this capability, the trust diverted resources to 46 new construction projects of non-profile construction, with a plan for 11.3 million rubles.

All of this served to lower the potential possibilities of the experiment, it created difficulties for the contractual organizations and, during the initial year of operations under the conditions of the experiment, the required degree of completeness in planning the indices for construction production between the contractual organizations of Mintyazhstroy and the ministry-clients was not achieved. It is our opinion that the introduction of 2-year planning should be accelerated in the interest of creating continuity in construction production, distributing the volume of marketable construction output uniformly by quarters and including this volume as a

mandatory index in the plan for capital investments. This plan must be coordinated with the plan for placing enterprises, capabilities and projects in operation and it is mandatory for the builder and contractor. The clients and planning organizations must display greater responsibility for the timely and high quality preparation of the planning and planning-estimates documentation.

A general index and one which defines the quantitative and qualitative aspects of the work being performed by construction organizations, under the conditions imposed by the experiment, is that of profit. All aspects of economic accountability are reflected in this index. Minmontazhspestroy fulfilled its plan for savings in 1978. In the case of Mintyazhstroy and notwithstanding an improvement in this index compared to 1977, it under-fulfilled its profit plan by a considerable sum.

The organizations of this ministry experienced above-plan expenditures of material and financial resources, their machines and mechanisms were not utilized fully, their overhead expenses were excessive and the organizational-technical measures for raising labor productivity were not carried out and all of this resulted in over-expenditures of the wage fund. Many organizations tolerated increases in estimated costs and sustained losses (more than 7 million rubles). The experiment increased the payment for credit. Mintyazhstroy's profit decreased by 4.9 million rubles owing to untimely payment of accounts. For disruptions in the schedules for turning completed enterprises, start-up complexes, phases and projects over to the clients, 1.9 million rubles were paid out at raised percentage rates. The construction organizations are still not obtaining profit from the clients in connection with a reduction in the construction schedules (50 percent profit for enterprises introduced into operations ahead of schedule), and the reduction in credit payments for projects delivered ahead of schedule amounted to only 1,500 rubles.

As a result of the reduction in profits, caused by a disruption in the construction schedules, and an increase in the amount of credit payments, the amount of money added to the funds for economic stimulation decreased by 491,000 rubles. Losses will also be sustained in 1979. The credit for expenditures for unfinished production, in the case of enterprises and projects (of the number of organizations checked) not delivered on schedule, amounts to 92 million rubles or 9.5 percent of the overall amount of indebtedness for this type of credit. From an economic standpoint, a raised percentage rate for credit payments must promote a more rapid completion of construction projects which were not placed in operation on schedule. During the 1st quarter of 1979, the plan for marketable construction output volume was over-fulfilled. This was explained by the fact that the number of completed facilities included construction projects, complexes and projects which were not introduced into operations in 1978.

The economic experiment carried out in the principal construction ministries of the republic is of great long-range importance. To turn over

marketable construction output on schedule, that is, to place enterprises, capabilities and projects in operation with minimal production expenditures -- this is the task that has been assigned to our builders. The experiment must successfully solve this problem.

The decree of the CPSU Central Committee and the USSR Council of Ministers on "Improvements in Planning and Intensifying the Effect of the Economic Mechanism With Regard to Raising the Effectiveness of Production and the Quality of Work" provides an answer to the question as to what can replace computed cycles at construction projects having extended construction periods. The ministries and departments of the USSR and also the councils of ministers of the republics have been authorized to develop plans and estimates for a construction duration for enterprises of more than 2 years, not for a project on the whole but rather for its first phase, on the basis of diagrams for the general plan for complete development of the enterprises. Simultaneously with construction of the first phase, authorization has been given to carry out the planning for subsequent phases, so that the required planning-estimates documentation will be prepared prior to the commencement of construction of the corresponding phase. The completion of the first and subsequent phases and their placement in operations must become completed construction products and a computed unit, instead of a cycle which does not reflect use value.

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Stroybank Supervision

Moscow FINANSY SSSR in Russian No 1, Jan 80 pp 29-30

[Article by V.N. Gerashchenko, deputy chief of the Municipal Administration of the Donetskaya Oblast Office of USSR Stroybank: "Improvements in Control Over a Bank"]

[Text] In the case of construction projects controlled by the Municipal Administration of the Donetsk office of USSR Stroybank, the proportion of capital investments for technical re-equipping increased in 1978 by 1.8 percent above the figure for 1977 and amounted to 59.2 percent of the overall volume of capital investments financed. Particularly noticeable is the trend towards capital investments for the technical re-equipping and modernization of existing enterprises of the ferrous metallurgy and electrical engineering industries and for projects of the Ministry of Railroads. In 1979, this trend was observed in the case of construction projects of other ministries.

During the course of analyzing the plans for capital construction and other documents and also during special inspections carried out in the different areas, the bank often uncovers incidents involving incorrect use of capital investments for the mentioned purposes. In particular, equipment is

delivered which, for one reason or another, an enterprise does not make full use of and, as a result, its supplies of available equipment increase.

For example, on 1 January 1979 there were 14.82 million rubles worth of uninstalled equipment remaining at the Donetsk Metallurgical Plant imeni Lenin, including 13.73 million rubles worth of domestic equipment and 1.09 million rubles worth of imported equipment. The principal causes of this situation include: unsatisfactory work on the part of the general contractor (Donetskmetallurgstroy Trust) and its sub-contracting organizations, insufficient deliveries during 1978 of individual types of equipment and metal structures for the start-up of this project and also deliveries of equipment for projects which are not included in the plan for capital construction for a number of years. Thus the fifth span of a 950/900 billet mill and a 670/380 mill were not included in the title list of a construction project for the Tenth Five-Year Plan, despite the fact that construction on the projects was begun during the Ninth Five-Year Plan and 6.28 million rubles worth of equipment were imported for these projects. Nobody at the plant is familiar with the schedules for installing this equipment.

It is our opinion that a stronger policy must be employed for controlling the ruble and permission must be granted for levying fines against the principal activities of the economic organs, for the purpose of the union budget, for unsatisfactory use of domestic equipment. Such a measure would force the builders into supplying the equipment for installation in a timely manner and the ministries -- into redistributing it more efficiently among the enterprises.

The ministries often allocate insufficient amounts of capital investments for projects under construction and this exerts an adverse effect on the course of construction and on the mastering of production capabilities. Such practice is typical of Minhermet [Ministry of Ferrous Metallurgy] for the Ukrainian SSR. In particular, it was for this reason that start-up complexes were artificially "matched up" to the Donetsk Metallurgical Plant, in terms of planned capital investments, and hence errors occurred in their composition. A start-up complex, Furnace No. 1 of the plant's electric steel smelting department, was reapproved four times, for example, and its final variation took shape only following the placing in operation of the furnace in June 1978. A number of auxiliary projects required for normal operation of Furnace No. 1 were excluded from the original complex and, as a result, the capability introduced was underdeveloped, compared to the planned figure, by 47.1 percent and the national economy was undersupplied with high quality steel by 20,500 tons, or 5.05 million rubles worth of steel.

A similar situation prevailed in the case of a start-up complex for Furnace No. 2 of the same department, which was to have been placed in operation during the fourth quarter of 1979.. This complex has already been examined three times. It is obvious that the clients and their higher organizations

must be dealt with in a more stern manner for failure to apply themselves in a serious manner in the development of start-up complexes.

The bank is presently devoting a great amount of attention to exercising control over the use of imported equipment at the construction projects. The institutions of USSR Stroybank are taking stock of the equipment and exercising control in order to ensure that it is delivered for installation in a timely manner. Nevertheless, there have been instances of unnecessary equipment being supplied to the construction projects, equipment which is not always being turned over for installation in a timely manner. On 1 January 1979, the supplies of imported equipment at the Donetsk Metallurgical Plant were valued at 1.09 million rubles, the guarantee period for which had fully expired.

The Ministry of Ferrous Metallurgy for the Ukrainian SSR called for the delivery of equipment for the fifth span of a billet mill 950/900 and a mill 670/380. However, the projects were not subsequently included in the plan for capital construction. Indeed, the equipment is aging both physically and morally and it is not known whether it will be used in the future during the construction of the mentioned projects.

Incidents have been recorded of the ministries ordering shipments to the enterprises of unnecessary imported equipment or equipment which cannot be installed. Thus the Donetsk Donbasskabel' Cable Plant, for a number of years, had imported equipment delivered to it which it never ordered (with the equipment valued at 1.13 million rubles). And it was not until 1978, following a great amount of correspondence between the municipal administration and higher organizations of the enterprise and the branch administration of USSR Stroybank, that this equipment was transferred to other construction projects.

In 1977, imported prefabricated-sectional warehouse buildings valued at 905,000 rubles were delivered to the Donetsk Machine Building Plant imeni Leninist Komsomol of the Ukraine. However, the warehouses had not been included in the capital construction plan for 1977-1978, since planning-estimates documentation had not been developed for them.

In 1978, the municipal administration, for unsatisfactory use of imported equipment, required the Donetsk Metallurgical Plant to pay a fine of 147,000 rubles into the union budget, the Donbasskabel' Plant -- 282,000 rubles and the Donetsk Machine Building Plant -- 162,000 rubles. When necessary, the guilty parties are held accountable for their actions by the organs of the public procurator and people's control. For example, a check carried out in 1979 on the authenticity of data concerning the delivery of imported equipment for installation at the Donetsk Worsted-Spinning Factory established the fact that the equipment had actually not been installed (equipment valued at 86,000 rubles). In accordance with the materials obtained during the check, the municipal administration confronted the rayon people's control committee of Donetsk with the question concerning the

incomplete deliveries of equipment, failure to coordinate the schedules for such deliveries with the construction work schedules, the accumulation at warehouses of unnecessary and surplus supplies of equipment and materials and construction imperfections at the sites. For example, in 1978 the Chirchik Elektrokhimprom Production Association was tasked with lowering its working assets by 1.2 million rubles. However, these assets actually increased by 100,000 rubles, the result of an increase in the supplies of uninstalled equipment, which in turn resulted from non-fulfillment of the construction work plan for preparing the sites for equipment installation.

In the case of the Tashkent Tractor Plant and a task for reducing working assets by 3 million rubles, an actual reduction of only 250,000 rubles was achieved. This was the result of a lack of preparation of the construction sites for a forge and pressing building and a transmission building. Thus the equipment imported earlier could not be turned over for installation. At the Almalyk Mining-Metallurgical Combine imeni Lenin, against a task calling for these assets to be reduced by 3.6 million rubles, the assets actually increased by 2.1 million rubles. This resulted from lack of preparation of the sites, ahead-of-schedule deliveries of equipment valued at 1 million rubles, for projects the construction of which was planned for 1979, and the presence of surplus equipment valued at 320,000 rubles.

The non-fulfillment of tasks associated with the mobilization of internal resources in construction is aggravated by shortcomings in their planning, especially in connection with a reduction in working assets. In 1978, for 18 construction projects checked by the bank, the task was established of reducing those working assets which exceed the actual amount remaining at the beginning of the year by 2.2 million rubles. Such unrealistic tasks were revealed in larger amounts: at the Tashkent Tractor Plant (180,000 rubles), at the RSU [repair and construction administration] of USSR Mintraktorosel'khoz mash [Ministry of Tractor and Agricultural Machine Building] (100,000 rubles), at an experimental-design bureau for packing and warpping equipment (259,000 rubles), at production associations of Uzbekbytkhimplast (386,000 rubles) and at Sredazugol' (308,000 rubles).

The tasks concerned with a change in surplus creditor indebtedness were not established correctly. In 1978, such miscalculations were tolerated during the course of determining the financing limits for construction projects of Minkhimprom [Ministry of the Chemical Industry], Mingazprom [Ministry of the Gas Industry], Minmedprom [Ministry of the Medical Industry], Minenergo [Ministry of Power Engineering and Electrification], Mintraktorosel'khoz mash [Ministry of Tractor and Agricultural Machine Building], Minstroydormash [Ministry of Construction and Road Machinery Manufacture], Minlegpishchemash [Ministry of Machine Building for Light and Food Industry and Domestic Appliances], Minzag [Ministry of Procurement, Minpromstroy-materialov [Ministry of the Construction Materials Industry], Glavsnab [Main Administration for Material-Technical Supply] for the Uzbek SSR and for a number of construction projects belonging to other ministries and departments. Owing to shortcomings in planning, fewer resources were

responsibility of the factory's management for the unreliable data supplied to the bank and it also restored the illegally cancelled loan and exacted a fine from the financing account of the enterprise.

Based upon the examples cited, it is apparent that state discipline is still being violated on a frequent basis. In this regard, we are of the opinion that measures should be taken aimed at ensuring complete use of all imported equipment at a construction project. Today the banks, in accordance with the instructions, automatically extend credit for such equipment shipped to construction projects and only after this has been done do they check upon the feasibility of importing it. Improvements in the control functions of the bank, for the use by the construction projects of domestic and imported equipment, will promote improvements in capital construction.

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Internal Reserves

Moscow FINANSY SSSR in Russian No 1, Jan 80 pp 30-31

[Article by Ye. M. Rodygin, chief of the Planning-Economic Department of the Tashkentskaya Oblast Office of USSR Stroybank: "On Planning and the Actual Fulfillment of Tasks Concerned With the Mobilization of Internal Resources"]

[Text] The timeliness and completeness of mobilization of internal resources are dependent upon sound planning for such mobilization and upon control over the actual fulfillment of tasks. Unfortunately, some ministries and departments are tolerating incorrect planning and quite often their subordinate enterprises and construction projects are not carrying out even realistic tasks. As a result, tasks concerned with the mobilization of internal resources are systematically not being carried out at construction projects in Tashkent and Tashkentskaya Oblast. For example, in 1975, instead of a planned mobilization valued at 28.4 million rubles, an immobilization of 5.6 million rubles took place and during 3 years of the Tenth Five-Year Plan -- 74.4 and 5.5 million rubles respectively. The task was fulfilled only during 1978 and only for 42.5 percent.

This was explained by the fact that 34 million rubles were diverted from the financial support for capital construction during 1975, for purposes not called for in the plan, and during 3 years of the Tenth Five-Year Plan -- 79.9 million rubles. This became the cause of non-payments: to the contractual organizations -- for work carried out, to the suppliers -- for materials and equipment and to the bank -- for loans.

Non-fulfillment of the tasks for drawing funds from a reduction in the supplies of equipment and materials results first of all from the untimely carrying out of the construction work schedules and from disruptions in the schedules for delivering sites for installation and the installation of equipment. The tasks are adversely affected by a number of factors:

available and this exerted an adverse effect on the course of capital construction and on the payment discipline of construction projects, construction organizations and suppliers of materials and equipment.

The institutes of Stroybank in Tashkent and Tashkentskaya Oblast, upon uncovering incidents of incorrect planning of the sources for financing capital investments, presented the appropriate ministries and departments with proposals for changing the tasks for mobilizing internal resources. However, in the majority of instances the requirements of the bank were not carried out. In 1979, unrealistic tasks were once again established for construction projects of USSR Minstankoprom [Ministry of Machine Tool Building and Instrument Industry] in connection with reducing working assets by 90,000 rubles. Mintraktorosel'khoz mash -- 50,000 rubles, Minstroydormash -- 30,000, Minelektrotekhprom [Ministry of Electrical Engineering Industry and Power Engineering Machine Building] -- 70,000, USSR MFS -- 110,000, Mintorg [Ministry of Trade] for the Uzbek SSR -- 122,000, Minavtotrans [Ministry of Motor Transport] for the Uzbek SSR -- 840,000, Minpromstroy materialov for the Uzbek SSR -- by 210,000 rubles. The situation is such that the ministries, departments and construction projects are not bearing proper responsibility for correct planning and for the actual fulfillment of the tasks associated with the mobilization of internal resources.

The weak organization of construction production, disruptions in the schedules for turning equipment over for installation, deliveries of incomplete equipment or equipment deliveries for projects not included in the construction plans, the accumulation of reserves of surplus and unnecessary equipment and other factors are bringing about an increase in the supplies of uninstalled equipment, in equipment spoilage and disassembly owing to prolonged storage and in the diversion of considerable monetary funds from the sphere of financial support for capital construction to the development of various types of "unproductive" expenses. The ministries, departments, enterprises and construction projects must display greater responsibility for correct planning and for the actual carrying out of the tasks associated with the mobilization of internal resources and, in particular, the payments into the budget for above-normal supplies of equipment and materials must be raised.

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CONSTRUCTION

DELAYS IN REPAIRING, COMMISSIONING NEW HOUSING

Forgotten Homes

Moscow PRAVDA in Russian 16 Jan 80 p 3

[Article by O. Aymal'dinov, deputy head of public reception room of PRAVDA: "Forgotten Homes"]

[Text] In Sormovskiy Rayon in the city of Gor'kiy, two small streets have been retained since ancient times -- Ambulatornaya and Divizionnaya. At one time, several dozen one-story houses stood on each of these streets. About 15 years ago, the construction of a new microregion commenced and the houses began disappearing one after another. Multi-story apartment buildings were erected in their places. After several years had passed, only six houses remained on Ambulatornaya Street and three on Divizionnaya Street. With the passage of time, these houses became dilapidated. In some instances the buildings underwent repairs and in others the tenants had to be transferred to other accommodations -- purposeful action was lacking in the rayon executive committee in this regard. In 1972, responsible officials of the rayon soviet assured the tenants: they told them that the mentioned streets are located within the zone of a future building system and thus they should be patient a while longer -- eventually they would be resettled.

Three more years passed. The people began to entertain doubts: is it possible that such resettlement would not take place? This time a certain amount of anxiety was generated by the chief architect for the city, V. Voronkov. "In accordance with a request by the Krasnoye Sormovo Plant," he explained in writing, "the territory of that portion of microregion No. 2 that is not built-up is turned over for housing and cultural-domestic construction. The plant plans to complete the building of the housing sector during the 1976-1978 period."

Once again the promised period has elapsed with no changes taking place.

"Why are they making fools of us for so many years? Why did they not tell us in the beginning that we would have to wait in line for our homes?"

such were the questions which the tenants sent in to PRAVDA. A briefcase filled with papers was delivered to the public reception room. These were answers to their appeals addressed to the rayon and municipal organizations. One answer contradicted another. For example, the builders moved an excavator out onto Ambulatoynaya Street for the purpose of digging a trench under a heating line. As it turned out, the trench had to pass very close to the houses. The tenants poured out onto the street: "What are you doing, who gave you permission to destroy our homes?" "We know nothing," declared the builders, "we have a plan to follow." "Yes and we have an official paper which prohibits you from doing this," reported the opponents. Truly, they held in their hands a letter from the rayon executive committee in which it was written in black and white: "The heating line will be moved."

Here is another similar story. Two eight unit apartment buildings (Nos. 31 and 33) on Respublikanskaya Street (in Sovetskiy Rayon) were also located within the zone of the building system. Four years ago the municipal executive committee transferred one of the tracts here to the Gorenergo Administration -- for the construction of a 9-story building.

Before commencing the construction, the following problem should have been solved: what was to happen to the old houses? Built 50 years ago, they have been in a state of disrepair for some time now. But not having solved the fate of these houses and not having found new areas in which to resettle their tenants, the builders, with the silent consent of the rayon executive committee, began digging out the foundations. Naturally, the people began to complain. The leaders of Gorenergo attempted to calm them: they appealed to them not to become excited and assured them that they would all be resettled in well planned apartments no later than July 1978.

Meanwhile the builders continued to intensify their work tempo and they installed a fence. Yes and they erected it in a manner such that it was impossible to reach the houses either by walking or riding. As a result, a conflict arose which required the interference of the Sovetskiy Rayon Party Committee. A discussion was held involving the participation of the tenants, representatives of the steamship agency to which the old houses belonged and the leaders of Gorenergo. Here the matter ended.

The two stories recounted above concern everyday problems, the solutions for which are not easy to obtain. However, meaningless assurances should not be issued in such instances. The members of the rayon executive committee and a representative of Gorenergo reassured the people and when the latter became aware that the promise was an empty one, their appearance made it appear as though nothing had happened.

Repair Delays

Tallinn SOVETSKAYA ESTONIYA in Russian 13 Feb 80 p 2

[Article by E. Lang, chief of the Investigation Administration of the Procurator's Office for the Estonian SSR: "Repair of a Roof"]

[Text] An official description is considered to be an authoritative document. It is taken into account when evaluating work and promoting an individual to a new position and it is used for creating a trademark for an enterprise or institute.

On the basis of such documents, an excellent reputation had been earned by Housing Administration No. 10 of the Tartu Municipal Housing Administration and, naturally, by the housing administrator L. Kisand. In the official description signed by the chief of the municipal housing administration, Kh. Khanson, emphasis was primarily placed upon its impressive period of work in connection with the housing economy -- since 1949. Moreover, Kh. Khanson stated that L. Kisand, as a housing administrator, proved herself to be a concerned, attentive and industrious individual and one who has earned universal respect and has become one of the best housing administrators in Tartu.

Housing Administration No. 10 has always been put forward as an example to the remaining administrations and on more than one occasion it won third place in a competition. During the 2d quarter of 1978, it was awarded the title of exemplary housing administration.

In turn, the housing administrator writes very fine references for her subordinates: "Niyra Metusala has been working for us since May 1972. Initially she worked as a technician and subsequently, for having successfully carried out her duties, she was promoted to the rank of engineer in 1974. In 1977, she became the chief engineer. She possesses organizational talents. She has been awarded the title of shock worker of communist labor. Under her direction, the housing administration has achieved outstanding indices on more than one occasion. She has been awarded certificates."

Housing administrator L. Kisand also values highly the work being performed by her remaining subordinates, including engineer Viyve Yurak.

Why is it then that this particular housing administration is of interest to the procurator's office, despite the fact that dissemination of the leading experience accumulated by exemplary organizations does not lie within the purview of procurator's supervision.

As is known, the law requires each institute and enterprise to follow in a strict manner the order established for handling citizen statements, complaints and recommendations, both oral and written.

The tenants also appealed to the Tartu Housing Administration No. 10 for assistance. The appropriate journal revealed that from House No. 20 alone, on Uus Street, the tenants wrote in concerning the same problem -- repair of a leaking roof -- on 23 occasions during the 1972-1978 period. The tenants explained that they were consoled and that a promise had been given that the repair work would be carried out. However, nothing was obtained in

writing in this regard. Based upon explanations provided by housing administrator L. Kisand during court proceedings, it was apparent that the housing administration had not responded to the oral statements.

However, the fact that the roof leaked and that water poured into an apartment was discovered immediately after the building had been turned over for operation in 1968. No complaints were delivered to the builders during the guarantee period. Subsequently, for a period of 10 years, the tenants had to recover their walls with wall-paper following damage by water and place pails and basins under the leaks. The housing administration remained calm. True, on one occasion, when one of the tenants instituted a civil action in court for the purpose of obtaining reimbursement for property and furniture damage, the court demanded that the housing administration pay the required amount.

It would be inaccurate to state that during the 10 years the housing administration took no action with regard to the roof. On more than one occasion, it attempted to patch it up and yet the work was never completed, owing either to a shortage of manpower or equipment. However, no proposal was ever made to include repair work on the ill-fated roof in the plan for the repair section of the housing administration.

The statements made by the tenants themselves concerning the bureaucratic and indifferent attitudes displayed by the housing administration workers were very convincing. When Ellen Bogachev went to the housing administration to register a complaint, concerning the fact that her wall-paper had been damaged once again by water, she was informed in a very terse manner that each individual must render the necessary repairs himself and that if she does not enjoy living in that house, then she should change her apartment. An even more striking incident was discussed by tenant Mayye Koort. On one occasion, during the winter, two workers approached her and offered to go out onto the roof of the 5-story house in order to remove the snow since, as workers, the rules for safety did not apply to them. However, the housing administration recommended that she find the workers who could repair the roof.

Once again a question arises concerning "exemplary housing administration." How could it reap rewards over the course of so many years?

The secret of the fame achieved by the housing administration was revealed to a court by engineer Viyve Yurak: "The response made to tenant complaints was one of the points in the conditions for the competition among housing administrations. In the interest of achieving the best indices, I maintained a second journal in which I recorded only those complaints which were resolved in a positive manner. We did not attempt to conceal from anybody the fact that two journals were being maintained. They lay on the desk. Comrade Kisand, the housing administrator, was in all probability aware of them, since she checked the maintenance of the journals from time to time.

During checks carried out on the work of the housing administration, we presented the journal in which all of the work carried out was recorded.

We were somewhat surprised by the patience displayed by the tenants of house No. 20, who despite the obvious lack of organization in the housing administration and its bureaucratic methods, did not seek assistance from the higher organs throughout the 10 year period -- the result mainly of their implicit trust in those officials responsible for creating normal conditions for them.

The end to this story on roof repair is extremely instructive for workers attached to other housing administrations and also for other officials who tend to neglect their official duties.

Chief engineer N. Metusala and engineer V. Yurak were held to be criminally responsible by the procurator's office and prosecuted. The court found their official neglect to have been proven and convicted them of non-fulfillment of their official duties, as a result of which the rights and interests of citizens, which are protected by law, were infringed upon.

The law condemns an indifferent attitude being displayed towards people and views it as a crime. Unfortunately, the former chief engineer of the housing administration, N. Metusala, stated during a court session that she did not consider herself guilty inasmuch as she was not aware that she was committing a crime -- failure to carry out her official duties.

Housing administrator L. Kisand, who for so many years had performed in an "exemplary" manner, departed her position. The management of the repair section of the housing administration, which had been unable to complete the repair work on the roof, subsequently added to the 1978 plan, was abolished.

The ill-fated roof was repaired during a preliminary investigation. However, I decided to relate this history owing to the fact that, as the saying goes, "it contains a hint of a good lesson for young persons."

Kaliningrad Housing

Moscow IZVESTIYA in Russian 12 Feb 80 p 3

[Article by V. Nevel'skiy (Kaliningrad): "New Housing Which Never Materialized"]

[Text] The residents of Kaliningrad love their city. They are proud to show guests the sights of the city -- modern highways, embankments, squares and new microregions. Nevertheless, when construction is discussed, a new feeling is being expressed -- dissatisfaction. This is easily explained: last year, thousands of Kaliningrad residents who gathered together to celebrate house-warmings never became new tenants.

We visited several construction sites in order to view "start-up projects" which had not been completed. On the floodplain portion of the Pregola River -- in the very center of Kaliningrad -- a lonely tower crane was being raised above an empty concrete box. The construction project was marked by a lack of spirit. In accordance with the plan, the foundation for this 10-story building, which is presently in a state of neglect, was laid more than 1 year ago. And despite the fact that the normative period for its construction is six and one half months, the fifth floor has yet to be completed after 1 year of construction work.

Two such buildings stand on a vacant lot off in the distance. The exterior of one is completely finished. Only the finishing work remains to be carried out. But no builders are to be seen here. And it is no wonder: 200 meters from the construction project, a heating line terminates. How is it possible to carry out finishing work if no heat is available?

There is still the other building -- for more than a week now, highly skilled installation personnel have been carrying out mediocre tasks here. They are awaiting the arrival of wall panels which were promised some time ago by a large panel housing construction plant. For all practical purposes, they have been standing idle: only six floors have been installed during two and a half months, despite the fact that twice as many should have been completed. The situation is even worse at a neighboring building -- the builders, tired from having to wait so long, dismantled their tower crane and they did so without having first installed protective fencing or loges. Certainly, the crane will have to be erected once again when the builders return.

During a speech delivered before the Tenth Session of the Kaliningrad Municipal Soviet, the leader of a brigade of installation personnel, deputy V. Krysin, defined the principal reasons for the lag in construction: "Prior to commencing the erection of a house, spur track and underground engineering lines must be installed and careful thought must be given to the installation technology. We have forgotten that a zero cycle with all of the required preparatory work must be carried out prior to the construction of a microregion. In addition to the above, a sharp reduction occurred in connection with supplying the brigades with prefabricated reinforced concrete items. Compared to several years ago, when our brigade installed a house in just 3-4 months, today 7-8 months are required. No longer does anyone recall installation work being carried out "from wheels," or other leading construction methods which formerly were introduced at our construction projects. Even the Zlobino brigade contract method has not advanced beyond the paper stage.

It is only necessary to see the condition in which items are received from enterprises of the construction industry. They must be "reworked" at the site using a sledge-hammer or axe, in order to give them a more acceptable appearance.

Owing to a high rate of idle time, earnings have decreased and personnel turnover has increased.

This is how the figures read: in 1979, the plan for placing housing in operation in Kaliningradskaya Oblast was fulfilled by only 61 percent and for controlling capital construction of the Kaliningrad Municipal Executive Committee -- by 59.6 percent. Of the overall area of 54,000 square meters of housing space that was not delivered by the Kaliningradstroy Association, the lion's share -- 45,000 square meters -- belonged to the oblast center.

At the present time, the leaders of the association -- chief A. Il'in and chief engineer I. Khandozhko -- when offering an explanation as to what occurred, often use the term "disruption." In the sense that all work, owing to a coincidence of circumstances, makes it impossible to cope with the task. Meanwhile, failure of the plan is by no means a random happening, but rather it is the natural result of blunders and mistakes tolerated in past years.

The initial alarm was sounded back in 1977, when builders attached to the USSR Minstroy system fulfilled their plan for placing housing in operation in Kaliningrad by 70.3 percent. One year later, they had only a trifle to add with regard to satisfactory completion of the program -- slightly less than four percent. But by no means was this somewhat consoling statistic explained by the fact that the causes of the ailment afflicting construction organizations had been found and radical measures undertaken aimed at correcting them. Rather, the statistic was viewed as being a purely external factor. When it ceased to function, and this occurred last year, the operational indices of the association plummeted downward quite rapidly.

This "external factor" -- compliance on the part of the municipal executive committee, which until recently had even accepted houses from the builders which contained serious defects and flaws. Actually, the annual plan, by hook or by crook, artificially reached an acceptable level. During subsequent months, work was carried out aimed at correcting all flaws and preparing the new construction units for settlement.

This vicious practice, which created a semblance of well-being, has now been terminated. Only those houses which are truly prepared are being accepted in the city. No longer is it necessary for construction organizations to include unfinished buildings in their reports.

Kaliningrad has at its disposal many capabilities for large-panel and large-block housing construction. They will make it possible to achieve greater volumes of housing construction than is presently the case. But in order to realize maximum benefit from this base, it must be employed constantly on a day-to-day basis. And this is not being done.

Instead of focusing attention on modernizing production, strengthening his rear organizations in a thorough manner and organizing close interaction

among all elements in the construction process, the general contractor resolved 1 year ago to concern himself with the radical reorganization of control. The system of territorial control over production, which had been created many years ago, was replaced by an association. Reliance was placed upon the fact that an administrative apparatus, if located close to the construction sites, is able to intervene in production matters more readily and concentrate efforts on the start-up projects. It should be based upon the use of enlarged brigades which operate according to the brigade contract method. But despite the fact that the number of these brigades is increasing, no major changes have taken place owing to the fact that such contracts simply do not exist. How is it even possible to discuss this subject if there is no production line at the sites or if the brigades are idle for greater periods of time than they are at work.

"Yes, we made mistakes" admitted the chief of the Kaliningradstroy Association, A. Il'in, "each must be examined and this requires more than a month's time. They must obviously be consolidated."

Thus, another reorganization must be carried out. Meanwhile, the situation at the construction projects has become more complicated. In addition to other unpleasant aspects, there is also a very acute problem associated with the construction of underground engineering lines. Even 5 years ago it was discussed at great length -- it was wrong to rely only upon the use of old engineering networks. Rather, the capabilities should be intensified so as to make it possible to coordinate the plan for installing lines with the program for housing construction. But the work never advanced beyond the discussion stage. Temporary solutions were found and very little thought was given to what the future held in store. The result is as expected: all of the reserves of the old networks have been exhausted and the capabilities which the city had at its disposal long ago fell behind the requirements for new lines. Newly built houses should not be placed in operation immediately -- not until the "threads" of water, gas, sewer and heating lines have been connected up to them.

Who was at fault for such a situation developing? Who will now correct the situation?

"The one indicated in the plan" frankly stated the chief of the association, "It is us -- we will concern ourselves with the problem. Meanwhile, three organizations are each carrying out some construction work."

This then is the situation. The impression is created that the general contractor in this complicated situation is nothing more than a detached on-looker. He is not disturbed, he takes not action and he does not attempt to seize the initiative. He is simply waiting for someone to solve this problem for him.

It cannot be stated that housing construction in Kaliningrad is viewed with an air of indifference. Both the party and soviet organs are doing everything possible to assist the builders. But this assistance will not be very effective so long as the leaders of the Kaliningradstroy Association fail to restore order in their rather well-neglected economy.

CONSTRUCTION

PROGRESS, PROBLEMS IN RURAL CONSTRUCTION NOTED

Achievement Data

Moscow STROITEL'NAYA GAZETA in Russian 1 Feb 80 p 2

[Text] In the 4th year of the Five-Year Plan the work forces of organizations of Minsel'stroy [USSR Ministry of Rural Construction] delivered a total of 21 million square meters of residential housing, schools and trade schools for 1.7 million students, barns for 5.7 million head of cattle, hogs and sheep, poultry barns for 92 million broilers and 6.9 laying hens, elevators for storing 13.4 million tons of grain and many other industrial and public facilities.

The rural builders made a significant contribution in 1979. The ministry fulfilled the annual assignment to deliver poultry factories, sheep farms and enterprises for producing raw materials, confection products, canned food and fruits, for processing meat and whole milk products, knitwear, furniture, and also kindergartens and hospitals.

By and large, however, the ministry was not able to cope with the annual plan for delivering industrial facilities and housing. Minsel'stroy organizations of Kazakhstan, Azerbaijan, Moldavia, Kirgizia and Turkmenia failed to deliver plants, houses and public buildings.

After analyzing the deficiencies Minister S. D. Khitrov noted poor industrial engineering preparation, imperfect performance of assembly organizations, a high proportion of manual labor, inadequate adoption of the brigade contracting procedure and of outstanding experience, the lagging adoption of planned capacities in the construction industry, slow development of the new form of organization of rural construction by SSK [Rural construction combine] organizations. The problem, according to the minister, is to increase the responsibility of workers at all levels.

I. A. Kharatishvili, Minister of Georgian Rural Construction, described what organizational-technical measures will be implemented to ensure that initiators of socialist competition of the industry will meet their responsibilities: the adoption of lightweight industrial fabrications in

many of them, improvement of the industrial administration system and of the quality control system of construction and assembly operations, and enrollment of 60% of the labor force in the brigade contracting routine.

V. D. Danilenko, Minister of Rural Construction of Belorussia, described the positive influence of weekly and daily planning work, organization of assembly line construction and activities of the assembly service.

V. D. Danilenko and Yu. B. Kotov, Minister of Rural Construction of the Ukraine, discussed how the watch method promotes an improvement of labor productivity, improvement of economic indices and improvement of labor conditions of rural builders. Their opinion is that this method should be legalized.

Discussing problems stemming from the resolutions of the November (1979) plenum of the CPSU Central Committee, members of the joint convention of the college of Minsel'stroy and of the Presidium of the Profsoyuz Central Committee cited measures aimed at the unconditional fulfillment of the government plan of 1980 with respect to all indices, especially the delivery of all planned projects.

Section chief of the Construction Department of the CPSU Central Committee A. M. Kosogov, Central Committee chairman of the trade union of construction and industrial construction materials workers I. A. Lanshin and officials of ministries and departments took part in the work of the college and Presidium of the Profsoyuz Central Committee.

Lags in Severo-Osetinskaya ASSR

Moscow EKONOMICHESKAYA GAZETA in Russian No 3, 1980 p 19

[Article by I. Vasilenko, Senior Economist of the Severo-Osetinskaya Republic Office of Gosbank]

[Text] The government and business are investing heavily in the development of rural construction. It is extremely important to use these investments properly and most effectively. Much has been done in our republic to improve the organization of rural industrial construction. Mezhselkhozstroyob'yedineniye was established in Severonaya Osetiya. Its membership includes 44 businesses. But I wish not to talk about successes in rural construction, but about failures and omissions, which delay and hamper the construction of facilities and have a negative effect on the quality of work.

I shall start with the drafting of planning and cost accounting documentation. There are still cases of the drafting of this documentation, especially for new construction, without adequate technical-economic substantiation, and without consideration of the prospects of economic

development and resources. As a result this planning-cost accounting documentation, as a rule, is not utilized.

Planning-cost accounting documentation on a cattle feed lot complex for 3,000 head of cattle of the Kirov kolkhoz, Ardonskiy Rayon, was revised several times by the "Sevosgiprogorssel'stroy" [Severo State Planning Institute for Rural Housing and Civil Engineering Construction] institution at a cost of 2.3 million rubles. The documentation prepared by the "Grozgiprosel'stroy" institution on the construction of a central heating plant of the "Ordzhonikidzevskiy" sovkhoz, of the "Plodoprom" trust at a cost of 57,000 rubles has not been utilized since 1973. This plan is now being rewritten by the "Plodoprom" trust.

The relations between the kolkhozes and contracting organizations in relation to calculations on the completion of construction-assembly operations, construction quality analysis and delivery of facilities by contract deadlines on the basis of construction time standards, still have not been completely straightened out. How else can you explain the fact that the amount of incomplete construction is increasing every year?

The client kolkhozes, in turn, are not adequately analyzing the need for new capital investments, and therefore the plans for design and research work are often formulated without adequate substantiation.

USSR Gosbank could play a positive role in the correction of these deficiencies. Its workers, by studying the desirability of new construction and the possibility of speeding up the adoption of capacities, and by analyzing the cost effectiveness of capital investments, should, in our opinion, advise clients and higher agencies regarding the desirability or timeliness of drafting of planning documentation on various facilities.

The conversion to continuous financing and crediting of capital investments is an important trend in the improvement of the organization of construction. Today projects, with few exceptions, are being credited within the scope of annual limits. At the same time some contracting organizations sometimes meet their annual quotas ahead of time, but they cannot obtain money when they need it, and therefore they are late in settling their account with suppliers for some of the materials they have purchased, and with the bank -- by borrowing.

The conversion to continuous financing and crediting of capital investments will help to solve these problems. To do this it is essential that work schedules not be changed, and that planned assignments be distributed through the years in accordance with construction completion time standards.

Experience has shown that the use of bank credit along with unrecoverable budget moneys will aim economic organizations toward more careful expenditure of financial resources.

Offices of Severo-Osetinskaya ASSR Gosbank already are monitoring the expenditure of resources in construction during the planning of capital investments, and then during the financing and crediting process. Finance organizations are receiving extensive support from agricultural organizations in this matter. Along with the Ministry of Agriculture of the republic and construction trusts, we are examining the work schedules of projects. We are managing to concentrate material and financial resources on startup facilities and on the reduction of incomplete construction projects.

Georgian Minister Comments

Moscow IZVESTIYA in Russian 26 Jan 80 p 3

[Article by I. Kharatishvili, Minister of Rural Construction of Georgian SSR, Chairman of the Council of Interkolkhoz Construction Organizations]

[Text] The Georgian Ministry of Rural Construction and "Gruzmezhkolkhozstroy" [Georgian Interkolkhoz Construction] have been working together hand in hand, as they say, for 5 years already. No, "Gruzmezhkolkhozstroy" has not lost its independence. But it has become a kind of "glavkom" of the ministry, working on a full-scale cost accounting basis. To be sure, it is a partner in the solution of the problems that agricultural builders are working on right now.

It is appropriate to explain briefly why we were forced to take this step. There was a time when, because of the expansion and increasing complexity of construction of kolkhozes, interbusiness construction associations began to be established. These associations could faster and better fill the orders of their organizers. At the same time rayons of the republic (often the very same ones) were developing their own industrial bases and subdivisions of the Georgian Ministry of Rural Construction. And the fact that some subdivisions were being developed without consideration of the directions and capabilities of others inevitably led to duplication.

As it turned out, both "Mezhkolkhozstroy" and the Ministry of Rural Construction were building facilities for the production of reinforced concrete products right next to each other. But they were low-capacity facilities, since the resources devoted to them were limited. This is no longer the case. The spheres of influence have been separated. Simply the elimination of the transportation of construction products, fabrication materials in opposite directions led to a sharp reduction of transportation costs, which produced an annual saving of about 600,000 rubles. Government and interkolkhoz construction organizations are now drafting unified plans of technical development. Significantly, the machinery inventory of rural building organizations has nearly doubled in recent years and the output-capital ratio has increased.

The combining of forces enabled the executives to vary the plans of contract work. Reasonable zones of influence were determined in consideration of the capacities and dislocations of government and interkolkhoz organizations.

Because the ministry has large specialized government assembly subcontracting subdivisions, the kolkhoz construction organizations were able to eliminate four of their own subdivisions of the same profile. Government trusts now complete special projects in the kolkhozes. The consolidation of "Gruzmezhkolkhozstroy" eliminated the need to seek subcontractors in other systems without forcing it to develop its own similar subdivisions.

Today the ministry is planning the technical direction of rural construction, is drafting a plan of future subcontract construction and of its own industrial production, and of the efficient expenditure of money appropriated for the development of an industrial base. It is also planning the work of a specialized automotive transportation organization and of the assembly service, is organizing reciprocal deliveries of construction fabrications and products and is studying accounting-contract and legal problems. A unified scientific-technical council of Minsel'stroy [Ministry of Rural Construction] and "Gruzmezhkolkhozstroy" associations is examining and preparing recommendations on urgent problems in rural construction.

This cooperation on the part of government and interkolkhoz rural construction organizations has enabled each subdivision to become more narrowly specialized. Consequently the quality of assembly and specialized jobs has improved and their volume has increased. For instance, in 1978 "Gruzmezhkolkhozstroy" completed 1.4 times more contract work than in 1973. In the last 5 years the association has fulfilled the plans of delivery of basic capacities and projects, has nearly doubled labor productivity and has cut construction costs accordingly. What is especially important, the average construction time of projects has been cut nearly in half in comparison with past years. This enables kolkhozes to place facilities in operation much earlier and to begin the production of agricultural products, and construction organizations to reduce construction delays.

It is important to note that the specialization and division of labor between government and business enterprises are being accompanied by the concentration of production. The annual average work load of one interkolkhoz construction organization increased in 1979 by a factor of 1.6 in comparison with 1974.

The joint solution of problems of technical improvement and rural construction technology, planning and the completion of government contract work on a cost accounting basis led to a reduction of the estimated cost of construction.

The main areas of development of rural construction in the republic in the future were defined 2 years ago. The industrial bases of both Ministrestvo

and "Mezhkolkhozstroy" are viewed in them as being a single system of cooperating enterprises, providing rural construction products with the necessary material resources. The system and procedure of reciprocal deliveries between government and interkolkhoz organizations have been determined. They will be regulated by mutual agreement.

Our form of management of rural construction organizations opens great opportunities for further strengthening of the industrial relations among rural, urban and interkolkhoz construction organizations.

Interkolkhoz construction organizations have also contributed significantly to the transformation of kolkhoz settlements. A total of 5,800 square meters of housing, schools for 6,000 pupils, kindergartens and nurseries for 2,750 children, clubs and culture halls have been delivered during the years of the present five-year plan. Livestock complexes have been erected, more than 15 tea factories have been rebuilt and several primary wineries, refrigeration and other facilities for storing and processing agricultural products have been built. It is important here that the delivery of projects has been sped up substantially by virtue of modern industrial construction techniques.

The combining of forces of construction subdivisions also permitted centralized planning, which had an appreciable effect on the quality of construction. In particular, the builders began to use more economical materials and fabrications. It is now cheaper to build, and the kolkhozes are beginning to enjoy the benefits. This joining of forces has had an especially beneficial effect on the volumes of rural construction in the lowlands and mountainous regions of the republic, and it has promoted faster economic development there.

The rural builders of Georgia are still confronted with enormous problems. According to preliminary calculations, we must increase the completion of contract work by approximately 60%. This is a real problem. The experience of economic cooperation between government and interkolkhoz construction organizations convinces us of that.

RSFSR's Rural Housing

Moscow SEL'SKOYE STROITEL'STVO in Russian No 2, Feb 80 pp 4-5

[Article by G. Vedevev, First Deputy Minister of Rural Construction of RSFSR]

[Text] The Communist Party and the Soviet government express great concern about capital construction. The growth of national production and improvement of the standard of living of our people depend to a great extent on its success.

Problems of capital construction were discussed thoroughly by the November (1979) Plenum of the CPSU Central Committee and by the second session of

the USSR Supreme Soviet. In his address to the Plenum Comrade L. I. Brezhnev noted that more than one-fifth of the national revenues is spent annually on capital construction, and how these moneys are spent determines both the indices of our economy and the rates of scientific-technical progress and industrial efficiency of the country.

An important place is reserved for rural construction in the great construction program. Concern about its development was a major component part of the agrarian policies of the Party. Back in the July (1978) Plenum of the CPSU Central Committee Comrade L. I. Brezhnev, speaking about the solution of the range of problems related to rural construction, emphasized that he was talking about the establishment of great rural construction combines, designed to manufacture complexes of lightweight prefabricated industrial structures and plants from them and the delivery to the client of ready to operate industrial facilities, about the development of subdivisions for completing special construction and assembly operations, about measures to strengthen housing construction, and about the organization of a network of rural home-building combines.

The experience accumulated by these combines shows that the concentration of industrial and construction production in one organization creates the necessary conditions for the complete utilization of available capacities, for supplying construction sites with fabrications and products, for reducing labor costs at the construction site by increasing the factory readiness of products and for more efficient utilization of construction machinery. All of this ultimately promoted an improvement of labor productivity and quality and shortening of construction deadlines.

Today the workers of SSK [Rural construction combine] and DSK [House-building combine] are concentrating their attention on the fulfillment of the plans of February and of the first quarter of the new year -- the concluding year of the 10th Five-Year Plan, the year when the foundation is being laid, on which the 11th Five-Year Plan will be erected. The Ministry of Rural Construction of the RSFSR requires of the workers of the combines in this important task to labor under a full load at the highest technical level to assure high efficiency and quality.

Experience shows that the foundation of success of SSK is laid as early as in the stage of formulation of the annual plans of contracting and volumes of delivery and production of fabrications. The construction administrations and trusts, along with clients, must, in consideration of the utilization of existing capabilities, develop, examine with interested organizations and affirm the directive schedule in at least 2 years. The plan calls for coordinating the deadlines of planning and transfer of the construction sites to the building contractors, with emphasis on the construction of engineering facilities and networks to support vital activities at the construction sites (laundry facilities, transformer stations, boilers, etc.). In other words, the time-tested "Orlovskiy continuity" must be adopted in rural construction. The Orlovskiy builders, who were the first

in the country to convert to the continuous planning and assembly line construction system, are successfully coping with the scheduled delivery of projects.

The directive schedule calls for the assignment of a full work load on the confirmed industrial capacities of the combines. The plan of contract work and plan of delivery of projects for SSK and DSK should be drafted specifically on the basis of this schedule. Then we will eliminate such undesirable phenomena as incomplete loading of combines, inclusion in the plan of projects that do not have planning and estimate documentation, assembled "boxes" of buildings that stand for years without being delivered due to the lack of engineering networks and auxiliary installations. The adoption of the continuous two-year planning system will provide an opportunity to complete the engineering preparation and preliminary development of quality plans of operation and preparation of work forces. And this ultimately will assure the rhythmic completion of construction projects.

Work schedules for the assembly line construction of projects for the entire current year should be developed on the basis of the directive schedule. These schedules must coordinate the deadlines on the preparation of "zeros," the movements of work forces and machinery, the construction of fabrications and their transportation to the construction sites and sanitation and electrical wiring operations.

Unfortunately, most of our SSK do not devote such detailed engineering attention to the annual plan. Consequently assembly teams often do not have prepared "zeros" in the first quarter (as was the case last year in regard to the Kalinin and Nelidovo SSK), and the combines do not manufacture completely assembled fabrications. As a result alone of underestimation of the importance of tying together all links of the assembly line by the Priokskiy SSK of Ryazanskaya Oblast, 22 "boxes" stand without plumbing. Prescribed construction deadlines are not being observed at most projects being constructed by the rural combines, thanks to the lack of a detailed schedule of assembly line construction and failure to solve problems related to its completion.

The ministry now has 22 SSK and DSK, 7 of which are general contractors and 15 subcontractors. We have the experience to intelligently combine the first and second forms of contracting. We cite the Yaroslavl' SSK of the "Primorkraysel'stroy" administration. Opened in 1977, it has already reached the planned capacity in just 2 years, has adopted the production of sanitation engineering cabins and has advanced to the manufacture of exterior wall panels for high-rise buildings. The combine exhibits high technical skill in industrial and construction manufacturing and is successfully practicing "turn-key" delivery of projects.

Why does this combine perform better than others? Perhaps it is working under special conditions? Nothing of the kind. This organization is so successful primarily because the supervisors of the "Primorkraysel'stroy"

administration (chief Ya. A. Iver) maintain strict labor, planning and technological discipline in the labor force. The Yaroslavl' SSK engages in construction as a general subcontracting organization and operates on two balances: construction and industrial. The combine handles the construction and delivery of projects as far as 100 km away from the SSK as a general contractor, enlisting specialized subcontracting organizations. The combine handles projects farther than 100 km from the SSK as a subcontractor: it simply erects buildings. Specialized teams of the PMK [not further identified] of the combine erect the zero cycle. Outside plumbing and wiring and landscaping are done by a subcontractor.

The fact is that the functions of general contractor (working with the client, clearing of construction sites, construction of access roads, construction of auxiliary facilities and laying of networks) take a great deal of time and divert the management of the combine from its main responsibilities. When an SSK accepts the functions of general contractor it is essentially transformed into a full-fledged construction organization, including industrial enterprises that manufacture fabrications. In this case it loses its identity as a construction combine, the purpose of which is to go to the construction site, erect a building on a ready-made foundation with its own prefabrications and, with the aid of the forces of subcontracting organizations, finish special assembly operations, make final adjustments and deliver the key.

The experience of the outstanding SSK and DSK proves that industrial enterprises must operate on a construction balance basis in order to enhance their interest in the solution of the main problem facing a combine, namely the speediest possible and highest-quality "turn-key" delivery of a project.

Today the ministry only has a few combines that operate on the construction balance basis. The conversion of all enterprises to this footing was delayed because their capacities are being used not only for the needs of the combines, but also for construction projects being completed by other construction organizations.

In ratifying the plans of 1980, the ministry instructed that all SSK and DSK be given work loads in consideration of the complete utilization of their existing capacities, and that they be converted to a unified construction balance.

The structure of the SSK and DSK and their interaction with other organizations that participate in contracting are very important in their operation. As an example we cite the structure of the Kalinin SSK. The combine has a KPD [Large-panel plant for housing construction] factory with a capacity of 66,000 square meters, three cost accounting sections on housing construction and a finishing operations section. The sections have seven assembly teams, each of which is the heart of the assembly line and controls its rhythm. A machinery column and mechanization section, equipped with motor and machinery pools, necessary for the construction of planned

projects, are operational subordinates of the SSK. A joint directive of the "Kalininsel'stroy" administration and "Tsentrosovkhozmontazh" trust established permanent teams of sanitation engineers and electricians, who do their work in accordance with a joint construction schedule.

Practically all links of the construction conveyor -- factory-transportation-mechanization-special operations -- are coordinated under the direct or operational supervision of the chief and chief engineer of SSK. It is difficult, perhaps even impossible to supervise such a chain without the appropriate documents for each link. Therefore a construction completion schedule by nomenclature must be drafted, task forces assigned and their transportation schedules determined, and a schedule of travel of machinery and assembly teams worked out for the entire planned year by the end of the preceding year.

The most important problem facing the SSK and DSK is to reduce labor costs and transfer a considerable fraction of them from the construction site to the plant. This can be done only if the combines complete their finishing operations with their own forces. Only in this way can the interest and responsibility of a combine in high plant readiness of the parts and fabrications they produce be increased. By order of the ministry, all combines are establishing finishing sections or columns, which must debug the buildings they erect and deliver them in "turn-key" condition to their contractor or client.

Problems of the improvement of the work of the SSK and DSK must be solved comprehensively. The most important, the key problem of the improvement of the performance of SSK and DSK, as of the entire construction industry, is improvement of the industrial-technological planning of construction projects.

A rural construction combine can be successful only with an efficient engineering planning system, using technological blueprints and week-by-week and day-by-day schedules. Without this system construction time is extended and delivery is delayed. Not only the basic fabrications of buildings, but also the roofs, verandas and other frame fabrications, parts of built-in machinery, staircases, window sashes, floor coverings and wall coverings in precut condition must be delivered to the construction sites all together and strictly on schedule.

In view of a shortage of manpower much attention must be devoted to elevating labor productivity, especially by increasing the plant readiness of parts and fabrications. We have considerable resources for this. For example, replacing ordinary plain ceiling panels with acoustically uniform factory-made 2.4-meter wide panels and ready-to-lay linoleum without on-site preparation will reduce labor costs for a single 27-square building alone by 94 man-days. The use of spacious bath houses instead of prefabricated reinforced concrete toilets will reduce labor costs at the construction site of the same building by 81 man-days. The use of stairwell

landings and stairwells of high plant readiness, and of balcony and deck slabs will also reduce labor costs substantially.

By order of the ministry the combines, beginning in 1980, must deliver to construction sites only completely factory-finished fabrications: exterior wall panels, finished on the outside and with an interior surface ready for cementing wall coverings, and interior wall panels and partitions, plastered on both sides; finished ceiling panels, ready for painting; paneled staircase landings, etc.

According to calculations, simply increasing the factory readiness of all fabrications can reduce labor costs for the construction of a 27-square building by 241 man-days, and this means, for example, that the Kalinin SSK, by producing high factory-ready fabrications, can recall from the construction site about 50 finishing workers annually. Therefore the factory shops must organize assembly lines or stations for finishing fabrications, maintain tools in good condition and, if necessary, buy new ones to be able to manufacture a product without on-site modification. To create interest and to encourage responsibility in this matter the ministry decided, beginning in 1980, to assign the finishing of buildings to the rural construction combines. Then the SSK supervisors can steadfastly and promptly solve all problems related to the improvement of factory readiness and find ways to staff the shops with additional workers so that the finishing of fabrications on the site will not take 2 or 3 times more workers than are necessary.

The problem of providing the SSK and DSK with skilled labor, along with the creation of normal living and social conditions for the builders, by order of the ministry, which will have the support of the labor force, will be solved by means of the extensive industrial adoption of the brigade contracting system. The brigade contracting system should pervade all links of the construction conveyor -- fitters, finishers, electricians, transportation workers and mechanizers. Each worker must be interested in the final product of his labor.

Nearly all the existing combines in the Minsel'stroy [Ministry of Rural Construction] RSFSR system are based on existing or nearly complete ZhBI [Reinforced concrete products plant] and KPD factories. They were merged with construction subdivisions into a single entity and acquired the status of an SSK. Therefore our combines do not have auxiliary facilities so vitally necessary for normal operation: shops, facilities for centralized manufacture of sheet metal products, glass, wall covering and linoleum cutting; there are no warehouses or platforms for packing and storing containers. It is still not too late at SSK under construction to revise the plans and re-examine the estimates, so that it will be possible, in addition to starting up basic capacities, to deliver the above-mentioned products. Standard blueprints, including necessary auxiliary facilities, must be developed for combines planned for construction in the 11th Five-Year Plan.

The design office of reinforced concrete of Gosstroy RSFSR already has drafted new typical blueprints of large-panel residential and public buildings of the 25 and 135 series. At meetings of the Technical-Economic Council of the ministry we regularly examine with the KB [Design office] problems related to the improvement of planning decisions and completeness and factory readiness of products and fabrications, and also of industrial technology. We will be able to practice the complete construction of settlements on the basis of these blueprints. Blueprints of farm houses of the indicated series, with outhouses, have already been developed.

Worthy of attention is the acoustically uniform ceiling panel, with 127 mm diameter recesses instead of 159 mm, developed by this KB and manufactured and placed on exhibit by the Kalinin SSK. It has a surface that is ready for linoleum and other clean floors.

The "TsNIEPgrazhdansel'stroy" [not further identified] Institute is perfecting plans of frame panel houses of the 209 series.

However, the ministry, along with the KB on reinforced concrete and TsNIEPgrazhdansel'stroy, must work on the expansion of the nomenclature of typical blueprints of farm houses, unification and enlargement of fabrications and improvement of the degree of prefabrication and factory readiness.

In order to improve the performance of rural construction and home-building combines it is necessary to radically restructure the finishing shops, motor pools, mechanization and special operations shops and to correct problems in the sanitation engineering and electrical wiring shops. Urgent measures must be implemented to ensure the increased factory readiness of manufactured products and to eliminate the delivery to construction sites of incomplete products. It is essential in the shortest possible time to finish foundations, to set up efficient assembly lines, adopt the brigade contracting system universally and encourage genuine socialist competition.

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Sector's Industrial Base

Moscow SEL'SKOYE STROITEL'STVO in Russian No 2, Feb 80 pp 15-16

[Article by A. Churkin, Deputy Director of "Giprosel'stroyindustriya" Institute, Candidate of Economic Sciences]

[Text] The resolution of the CPSU Central Committee and USSR Council of Ministers "Improvement of planning and strengthening of the effect of the economic mechanism to improve industrial efficiency and quality" calls for the development of specific measures to organize the most effective utilization of capital investments in construction, including rural construction.

The goal-oriented work of planning organizations represents a great reserve for the solution of this important problem. Here is anything but a complete list of possibilities for the planners in this respect: the correct, comprehensively weighed and economically sound choice of future construction sites, determination of the optimum capacities of enterprises, the successful solution of the general plan, the adoption in industry of modern new materials and machinery, improvement of the efficiency of technological lines, machinery and tools, and scientific-technical progress.

The "Giprosel'stroystroyindustriya" [State Planning Institute for Rural Housing and Civil Engineering Construction Industry] institute is actively engaged in this work. It is the main planning organization of the USSR Ministry of Rural Construction.

The economically sound choice of future construction sites and the greatest possible growth of capacities of existing plants through expansion, reconstruction and retooling are, as is known, extremely important factors in terms of the reduction of construction costs and fastest possible amortization of investments. With this in mind the "Giprosel'stroystroyindustriya" institute, in cooperation with other planning organizations of the USSR Minsel'stroystroy [Ministry of Rural Construction], developed the "Comprehensive plans of development and distribution of material-technical base of construction organizations of the union republic Minsel'stroystroy organizations for 1976-1980."

The need of ministry organizations for construction materials and fabrications is examined comprehensively and calculated in these plans with a view toward assuring scientific-technical progress and the completion of the planned level of prefabrication. A complete list of enterprises by republic, kray and oblast, which must be rebuilt, and then expanded, reconstructed or retooled, is defined.

The production of all these enterprises of the construction industry, along with the existing ones, should assure fulfillment of the plan of contract work of the corresponding Minsel'stroystroy organizations.

Today, in determining the desirability of constructing new, and of expanding or reconstructing existing enterprises in 1976-1980, the Minsel'stroystroy organizations of the union republics are guided by this technically and economically sound list of projects. The same kind of technical-economic substantiations are being drafted for large projects.

Comprehensive plans of development and distribution of the material-technical base and of the social development of organizations of the ministries of rural construction of the union republics and of USSR Minsel'stroystroy as a whole for 1981-1985, are being developed in consideration of the requirements of the Resolution of the CPSU Central Committee and USSR Council of Ministers "On improvement of planning and reinforcement of the effect of the economic mechanism to increase industrial efficiency and

quality." After the final confirmed figures for the 11th Five-Year Plan are received the drafts of the comprehensive plans will be revised appropriately and put into effect.

It is planned to establish a procedure whereby the question of the construction of a new or of the expansion of an existing enterprise of the construction industry in the USSR Minsel'stroy system will be answered only if the project is included in the developed and approved comprehensive plan.

During the selection of construction sites for enterprises the institute will strongly recommend that the client locate them in industrial centers if possible and build common facilities for main and auxiliary production, warehouses, transportation, power supply and engineering plumbing. This will bring about economically effective and intelligent decisions in relation to water supply, sewers, power supply, heating, rail and road access, water conservation and protection of the soil and atmosphere.

For instance, the institute has developed plans for an industrial center in Nytva, Permskaya Oblast, for Permoblisel'stroy [Permskaya Oblast Rural Construction] as a part of a construction fabrications combine, DOK [Woodworking combine], a "keramzit" gravel plant with a capacity of 100,000 m³ per year, a garage for 150 vehicles, an industrial base for special assembly fabrications, and a metal form and nonstandard tool plant with a capacity of 18,000 tons a year. These facilities are located quite close together by virtue of the blocking of industrial and auxiliary buildings and installations, the development of common engineering facilities (boiler, transformer substation, reservoirs and water purification plants, etc.). Common highways and railroad spurs are planned. The amount of land saved by this plan was 7.3 ha. The total saving of capital investments on all the listed items was 3.71 million rubles, including the cost of construction and assembly operations, which totaled 2.12 million rubles. The work force was reduced by 127 employees.

Here is another example. The technical plans of a large sanitation engineering and electrical wiring plant with a total capacity of 9.5 million rubles of production annually, to be built in Pokrov, Vladimirskaya Oblast, provide for common engineering plumbing and installations for a group of enterprises of the RSFSR Minsel'stroy: a reinforced concrete products factory, mechanization base, sawmill, DOZ [Woodworking plant], UPTK [not further identified] base, garage, etc. This measure saved 200,000 rubles.

Expansion of the capacities of existing enterprises, chiefly by means of reconstruction, technical retooling and expansion, represents a substantial reserve for reducing construction cost estimates. Therefore the institute, when drafting comprehensive plans, first investigates the feasibility of modernizing existing enterprises, and if there are no enterprises in a particular rayon the question of new construction is studied.

For instance, a plan developed by the institute calls for the expansion of a metal fabrication plant in Georgiu-Dezh with a capacity of from 29,000 to 91,000 tons annually. The enterprise will be a compact facility in the same block as an existing plant, located in the industrial center.

During the expansion of a plant on a new site, examined as an alternative, it was necessary, under otherwise identical conditions, to construct on the site additional railroad spurs at a cost of 160,000 rubles, a boiler plant at a cost of 190,000 rubles, and a storm sewer system with its own water treatment facilities at a cost of 130,000 rubles. Thus, siting the plant in the industrial center made it possible to cut the costs of off-site networks alone by 480,000 rubles.

The reduction of construction costs without sacrificing good technical-economic indices of future plants depends to a great extent on the correct determination by planning organizations of the optimum capacity and nomenclature of the products of future enterprises. The larger an enterprise (within certain limits, of course), the lower the cost of its production. Therefore clients and planning organizations want to build larger plants. However, as productivity increases transportation costs for delivering it to the consumers also increase. This is especially true of our enterprises of the construction industry, which supply products and fabrications to rural construction organizations, scattered over vast territories and engaged in the construction of comparatively small buildings.

The optimum capacity of an enterprise is determined on the basis of the combination of the maximum possible reduction of production costs, transportation costs, capital investments and certain other factors.

The most important task of planning organizations, toward which the above-mentioned resolution of the Party and government directs us, is to do technical-economic calculations more carefully, to find the optimum solutions and resolutely defend them.

For example, the average optimum capacity of new prefabricated reinforced concrete enterprises for rural construction in the current five-year plan was 60,000 m³, whereas in 1981-1985 it will be increased to 70,000 m³ in consideration of an expansion of the volume of construction. By increasing the average capacity of a plant it will be possible to cut capital investments by 3-5%.

The optimum average capacities of ZhBI [Reinforced concrete products plant] for the USSR Ministry of Agricultural Construction for this five-year plan, by regions, will be approximately (in thousands of cubic meters): European section of the Russian Federation (including the Nechernozemnaya zone) -- 80 to 100; the Ukraine, Belorussia, Moldavia, Lithuania and Transcaucasian republics -- 100 and above, Kazakh and Uzbek SSR and other republics of Central Asia -- 60 to 70, regions of Western and Eastern Siberia and the

Far East -- 40 to 50 (the difference in the figures of the optimum capacities is attributed to the different densities of rural construction projects per unit of territory).

When determining the desirable capacity of plants it is also important to take into consideration the nomenclature of the products they will manufacture, and also the future technical-economic indices of the enterprises.

Thus, the indices of large-panel home-building plants are substantially lower than of plants designed to produce agricultural structures.

The institute is conducting a major study, aimed at increasing the effectiveness of capital investments. However, there are several deficiencies in the project. Production technology is not always developed satisfactorily. Consequently the utilization coefficient of equipment is low, design solutions are sometimes imperfect, problems of the general plan are not always completely thought out, etc.

The work of planners to reduce construction costs also depends to a great extent on the client. Unfortunately, the client not always considers the possibilities of hiring a labor force for new enterprises. Consequently the summary estimates have to include considerable sums of additional money for the construction of new homes and public facilities. Cases arise when the clients, often at the insistence of local planning organizations, try to secure a site for the construction of enterprises where it would be possible, at the expense of that project, to solve general problems of the development of engineering networks of population centers, and sometimes of the development of new settlements.

This tendency still continues to exist. Every construction organization wants to have its own enterprise, for example, for manufacturing reinforced concrete prefabrications, while right next door there are underutilized factories manufacturing the same products, but for a different department. Disregarding the needs of the government, they do not try to reach agreement on reasonable work loads of existing enterprises, but insist on building a new plant, but "their own."

In our view there is a need to practice much more extensively the development of technical-economic substantiations, both for planned projects and for enterprises destined for expansion, reconstruction or retooling. The development of technical-economic substantiation for every project should be an absolute law.

The successful solution of all these problems is of vital importance to the government. The enormous opportunities for saving capital investments must be exploited.

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CONSTRUCTION

RENOVATION OF CENTRAL ASIAN URBAN AREAS VIEWED

Tashkent STROITEL'STVO I ARKHITEKTURA UZBEKISTANA in Russian No 12, Dec 79
pp 14-18

[Article by Candidates of Architecture L. P. Lavrov and B. R. Lunin, Leningrad Institute of Civil Engineering: "Comprehensive Solution of Central Asian Urban Renewal Problems (Pilyakash District in Andizhan)"]

[Text] Urban renewal in Central Asia requires the solution of a wide range of difficult problems pertaining to different areas of urban construction, sociology, climatology and urban life, and representing unquestionable interest for experts not only of that region, but of the entire country as well. In this connection the participation of coworkers of the Leningrad Institute of Civil Engineering in the development of recommendations and plans on the reconstruction of the Pilyakash region in Andizhan is no accident, especially since among the professors and educators of the institution there are quite a few scientists who are very familiar with the history of the architecture and modern construction of Central Asia. Representatives of all departments of the architecture faculty, and workers of the department on construction and architecture affairs of Andizhanskiy oblispolkom¹, took part in a study, related to reconstruction of the Pilyakash area. Consultations with planning and scientific-research organizations of Uzbekistan were obtained on a number of problems. All of this facilitated the comprehensive examination of the problems and the development of comprehensive recommendations.

The reconstruction of the Pilyakash region² is prescribed by the general plan of Andizhan, drafted in 1967 by the Uzgosproyekt Institute and approved by Gosstroy of the republic. Pilyakash is located in the northern

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²Most of the residential region identified in general plan No. III and located within the boundaries of Svoboda Prospekt, Altynkul'skaya, Yakshi streets and Zhdanov Prospekt, is named the Pilyakash residential region.

urban region and occupies a central location: its entire southern boundary is adjacent to the urban center, now under construction, and it extends eastward to the main Andizhan-Svoboda Prospekt highway. Today the region is unplanned. Small domiciles (64%) predominate with some green areas and business establishments, the capital investment level of which does not meet health and urban construction requirements. The new project is located basically along the eastern and northern boundaries of the residential region and is made up of a few 1-2 and 3-4-story brick houses. The engineering networks serve only high-rise structures. The area also has a children's hospital, tuberculosis sanatorium and a large light industry enterprise -- the Volodarskiy factory. In the southern part of the area there is a government-protected monument to Dzhami architecture, and three irrigation ditches, the Dal'verzin, Rabat and Tokmak, flow through the region from east to west.

A full-scale investigation of the region was conducted, plans and literature sources related to the subject matter of the investigation were analyzed during the preparatory stage of the project, and this made it possible to supplement the resulting assignment and make it more specific. It was first decided to set aside three construction regulation zones, i.e., to partition the residential area by the "guzarniy"* principle. The purpose of this decision was to preserve, if only partially, the specific psychological color, long inherent to the environment of the Central Asian city, and to use the ancient technique of irrigation, of course not for water supply, but as a decorative watering system, and to establish green oases around public centers. The gradual transition from the interior spaces of the home through the mandatory courtyard to the exterior spaces of the street, the "guzarniy" and rayon centers, renders the entire spatial system of the Central Asian city compatible with the stereotyped behavior of the citizens. The preservation of this environmental hierarchy of the architecture was also assumed to be an important objective.

The climatic and landscape features of Central Asia facilitate the extensive utilization of microregional territories. Undeveloped spaces in the residential centers are becoming a natural extension of the home. Architect V. K. Ankudovich's studies indicated that the rate of utilization of strictly residential territories of the microregions (i.e., outside of the public functional zones) is 10 times greater in Tashkent than in Leningrad. At the same time a considerable part of the territory of new microregions is not being utilized in Central Asian cities, which is partly related to a substantial surplus of public green zones in comparison with standards. Experience has shown that the low density of construction and large surplus of public green zones hamper the adoption of the territories and promote the formation of vast empty spaces, which intensify heat and are sources of dust. Low residential housing densities are more likely to lead to a deterioration of living conditions than to an improvement.

Specific conditions of the city invite a careful examination of the original premises of the plan: a shortage of territorial lands and the

* [guzarniy--a city district or quarter]

exceptional national economic value of irrigable lands surrounding the city. Quantitative indices of the region to be reconstructed were determined in consideration of these circumstances. Based on the data of the plan, the residential region will be made up of residential buildings of different heights: 31 1-2-story, 54 4-story, and 15% 9-story and higher buildings. The calculated area of the reconstructed territory is 135 ha. Given a maximum "gross" density of $2,800 \text{ m}^2/\text{ha}$, the total living space in the region will be $308,000 \text{ m}^2$, and the population, based on the 9 m^2 per capita standard, will be 34,200 citizens.

The planned architectural makeup of the region is based on the concept of preserving the urban construction principles of the existing architecture: the development of a large residential complex of the carpet architectural style along local highways, and zoned into individual blocks of the developed system of irrigation canals and sidewalks. The main compositional elements are two perpendicular local highways, approved by the general plan of the city, and a circular irrigation channel, proposed by us, which will flow through the region. The development of this concept was also based on the optimum utilization of the basic existing local streets and sidewalks, which in the future will facilitate the completion of the step-by-step reconstruction of individual neighborhoods. This approach to residential reconstruction will also help to preserve the traditional local spatial approach and, to a certain extent, the planned residential zoning system, but on a new and contemporary level of urban development.

A pedestrian way that parallels Svoboda Prospekt is being built. It is viewed as a green duplicate of the main street and will connect the municipal trade center and the planned residential center. The pedestrian mall will be surrounded by a rhythmic complex of 7-story apartment buildings on the east side, contrasted by a picturesque community on the west side.

The southern gateway into the region, from the municipal center, is accentuated by a group of 9-story buildings, opposed by a 4-story complex, which is being built behind the historical "guzarniy" center. This center will be modernized and will be an annex to the brightly colored national bazaar on the opposite side of the street, part of the municipal center. A unified complex of a microregional public service center and administrative complex of the paper mill will play an important role in the composition of the western gateway into the residential district. The expansive buildings of this enterprise, located on the opposite side of Zhdanov Prospekt, are contrasted by the plastically laid out spaces of the cooperative center.

The civic center of the residential district, with all the necessary (in accordance with SNiP [Construction norms and regulations]) institutions, which should be housed in coordinated 1-3-story buildings, will be located at the intersection of the local highways, nearly in the geometric center

of the neighborhood and at the intersection of the main pedestrian ways. In that way it will be a natural continuation of and an intermediate link between the local architecture, surrounding the center on three sides, and the high-rise apartment buildings, which will serve as a unique kind of landmark.

The business and public service system was planned in consideration of the proximity of the municipal center and will consist of two neighborhood centers for 12,000 citizens and a number of "guzarniy" centers. The deficiency in the calculated indices of the neighborhood centers will be covered by an appropriate increase of the capacity of the community and municipal centers and will be distributed among small "guzarniy" centers with 2-3 businesses. This decision presumably will provide a more uniform coverage of the residential region by service institutions.

The planned number of day care centers and schools will be built, but if the schools are built between the high-rise and carpet-style buildings the day care centers will be spaced uniformly through the entire area, maintaining the standard access radii.

The residential architecture of the region, in accordance with the received assignment, will consist of the following: high-rise (from 3 to 10 stories), multilevel and carpet architectural styles (1-3 floors). The assurance of a smooth transition from the carpet to high-rise architectures was the main compositional task.

The selection of the best types of residential buildings required an examination of a wide range of problems, some of which could be solved on the basis of national premises; others required additional detailed investigation. In particular, the need to guarantee the best health standards in the hot climate, where many cities, including Andizhan, have a long hot summer, was taken into consideration. The most radical means of controlling heat is to convert to complete air conditioning in the rooms. However, the use of this approach involves a number of negative consequences, which have arisen both in foreign and Soviet experience: shortening of the time of contact between the inside and outside environments, strong temperature difference between them, which has an undesirable effect on the human body, the economic aspect, etc. The adoption of total air conditioning in public housing construction presumably should be preceded by the necessary preparatory experimental research. The combined method of controlling the microclimate, based on a combination of technical, urban construction and architectural measures, is the most promising approach for the future (experts of the TashZNIIEP [not further identified] and UzNIIPgradostroitel'stvo [not further identified] institutions made an important contribution to the development of this problem). A system of spaces with intermediate characteristics, depending on the degree of stability of the microclimate, level of aeration and insulation, is being developed for the transition from enclosed, cooled in the summer and heated in the winter, rooms to the open environment. The application of the

combined method will not interrupt the transition from home to outside. On the contrary, it will require the complete utilization of all natural resources. Shading green belts and the cooling properties of the soil must be used more extensively. These premises were taken into consideration during the drafting of recommendations on the architectural planning of apartments and houses for the Pilyakash region and composition of the nomenclature of structures.

The socio-demographic and national lifestyle features of the region exerted a strong influence on the determination of the architectural nomenclature. The high proportion of multiple-child families, whose lifestyle continues to exhibit many traditional features, was considered. The growing group of families whose lives are based on new, contemporary footings, was also taken into consideration. (The materials of M. A. Budagova and L. N. Rusanova of TashZNIIEP were used in the work on this subject).

There will be a closer relationship between the home and environment and sea level, which will make it possible to improve the microclimate of apartments and to increase the utilization of the territory of the region for the needs of the population. The technological capabilities of local construction organizations, the existence of an industrial base and other aspects of the problem were also taken into consideration during the drafting of recommendations on the zoning of the residential district and choice of types of houses.

In the system of 1-3-story buildings of the carpet architectural style, with several courtyards (the types of houses developed by the UzNIIPgrado-stroitel'stvo institution under the supervision of I. I. Notkin), the largest families, engaged in a well developed domestic economy, will reside. These houses will consist of wall to wall apartments, grouped around a small green yard with a bath house, playgrounds for the children, pavilions and other small facilities for adult recreation. According to the plans most such apartments will be erected along the irrigation canals and main pedestrian ways. Large families who are not engaged in a large domestic business will be housed in 3-story block houses, designed by LISI [Leningrad Construction Engineering Institute]. Each apartment will have direct access to ground level, where there will be small yards. The top floors will also have balconies and a usable sun roof.

Medium-size families will continue to live in the 4-story microsectional buildings, which will permit the utilization of the existing capabilities of the local construction industry. Several modifications of the architectural planning will be incorporated for the purpose of improving the functional properties of these homes; there will be direct access to the yard from the decks of the first floor apartments, and under the decks there will be half-underground storage sheds. Buildings higher than four stories will be built on the basis of the gallery architectural plan. In addition to small apartments for small families there will be split-level apartments for medium-size families. The living rooms of these homes will

be wider than usual, so that unique small "front gardens" can be planted at the entrances into the apartments. They will moderate the microclimate of the home and provide a protective zone in front of the windows of the apartments.

A combination of buildings of different architectural design, with different numbers of floors and different appearance will provide the prerequisites for solving the problem of expressiveness in public housing construction. At the same time, the differentiation of types of homes in accordance with the features of the families residing in them will make it possible to improve local land utilization and will provide housing for different socio-demographic groups in accordance with their specific requests. For instance, high-rise apartments will be erected, as a rule, near public service centers, which will enable much of the population to save time when buying food and commercial products, and to go to public recreational institutions. Large-family homes will be built in the most peaceful and wooded zone of the region, where the children can play and the elderly can rest. The differentiated population principle is also reflected in the organization of the public service system. The public service institutions basically will be able to offer the calculated volume of services. Only a little redistribution of functions among regional and neighborhood facilities and the development of a network of "guzarniy" centers are planned. The regional center is designed as a group of multi-functional buildings, in which businesses, restaurants and public service outlets and public assembly halls will be grouped under long-span shelters. The neighborhood centers will also have businesses and administrative and recreation facilities.

The construction of "guzarniy" centers will make it possible to provide a uniform network of small squares at public meeting places, instead of community and neighborhood yards. Such a center typically will include the traditional businesses: tea house, a 2-3-cashier grocery store, etc. The construction of these centers is all the more justified when one considers that the local ethnic nationality constitutes two-thirds of the population.

The pedestrian ways of the Pilyakash residential district will be based on a wide circular boulevard, which will be laid out in consideration of the distribution of service centers and municipal transit routes. In some places the pedestrian walkway system will parallel the system of flowing irrigation ditches and connecting canals. Automotive access to homes will be separated from the walkways, and there will be streets from rayon highways or from roads surrounding the residential region.

And so, the Pilyakash renewal plans demonstrate the practical application of scientific recommendations that have been developed. They are based on the comprehensive analysis of social, structural and technological, climatic and aesthetic factors, the utilization of scientific-research materials and local national lifestyle traditions. There is hope that the utilization of these suggestions in the reconstruction of the Pilyakash region will promote the development of comfortable living conditions and will give expression to the architectural complex.

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BUILDING MATERIALS

NET COST, PLAN RESULTS, LAGS IN CEMENT INDUSTRY

Calculation of Net Cost

Moscow TSEMENT in Russian No 2, 1980 pp 16-17

[Article by V. S. Karelin, Candidate of Economic Sciences and I. V. Kulinina, engineer: "To Improve Planning, Estimating and Calculating the Cost of Cement"]

[Text] Planning expenditures, estimating them and calculating the cost of a product plays an important role in improving the system of planning production, in increasing the rate of economy and in regulating pricing.

Beginning with the 11th Five-Year Plan an index of cost reduction for production will be stipulated in five-year and annual plans for individual sectors of the industry as is emphasized in the CPSU Central Committee and USSR Soviet of Ministers Decree "Concerning an Improvement in Planning and Increasing the Influence of the Economic Mechanism to Improve Production Efficiency and the Quality of Work."

The sector's Regulations concerning planning, estimating and calculating the cost of cement were worked out by the Scientific Research Institute of Cement in collaboration with cement plant personnel and were approved by the USSR Ministry of the Construction Materials Industry on 15 December 1970.

The application in practice of the Regulations which are in force confirmed the validity of its basic principles. However, after the Regulations were published several changes in planning for expenditures occurred; the necessity of calculating the cost of high grades of portland cement arose. Improvements in planning and estimating expenditures in the cement industry were required for this; in particular it was necessary to unify the methods for attributing individual expenditures to calculation items, to define the list of calculation items and to alter, when calculating the cost of a product, the principles for allocating expenditures for maintaining production and management (expenses for maintenance and utilization of equipment,

shop expenses and general plant expenses). In conjunction with an increase in expenses for protecting the environment the necessity has arisen of also defining the system for attributing them to the expenditures for manufacturing a product.

We shall examine the problems that require solutions related to calculating the cost of cement which will be reflected in the Regulations worked out by the Scientific Research Institute of Cement.

Defining the list of calculation items. The list (2) basically meets modern demands of planning. However, considering the increasing expenses of plants to maintain and utilize equipment it is necessary, when analyzing the cost of cement, to single out in the formula expenses for the amortization of equipment, means of transportation and for lining furnaces.

As practice has shown during the work of cement plants expenses are not planned or estimated for the item "Compensation for wear and tear of tools and special purpose devices and similar special expenses." Accordingly it is suggested that this item be removed from the list.

The composition of direct expenses. There are no indications of how to attribute expenses which are related to water requirements in the Regulations which are now in force. Regarding the introduction of payments for water, these expenses should be attributed to essential materials since water is needed to prepare slime during liquification and cooling of gases for the dry method of production.

The Regulations should stipulate planning and estimates for the fuel and power which are consumed for the dry method of production when drying the raw material components.

In order to more fully estimate expenditures for the item "Energy for technological purposes" it is suggested that expenditures for thermal energy should also be calculated together with expenditures for electric power and compressed air.

Expenditures for recultivating land and payment for agricultural earth removal. The State Committee on Prices in the USSR Council of Ministers recommended (in 1976) that expenditures for recultivating land be reflected in the cost and wholesale price of non-metallic construction materials. Along with this a rate was proposed for recultivating land in the amount of six kopecks per cubic meter of non-metallic construction materials. The consumption of these materials for 1 ton of cement comprises about 1.3 tons of limestone, chalk, and marl and 0.4 to 0.5 tons of clay which approximately corresponds to 1.2 cubic meters of non-metallic construction materials. Consequently, the expenses for recultivation should be planned in the amount of

approximately seven kopecks per ton of cement. The planning agencies should differentiate the above rates according to regions originating with the actual expenditures for recultivating land.

The method of including expenses for recultivation of land in the cost of a product is expressed in the "Regulations concerning the system for financing work to recultivate land" which was approved by the USSR Ministry of Finance on 21 June 1978. The funds which are allotted for recultivating land are attributed to the cost of the product in the item "Similar production expenses" under the reallocation category "Extraction of raw materials," i.e., in the cost of limestone, chalk, clay and others.

In the Regulations (2) which are in force there are no directions to indicate the method of including payment for agricultural earth removal in the cost. Meanwhile such payment has been introduced in a number of union republics where stripping of the land has been approved.

Enterprises attribute these expenses in different ways: at the expense of start up-adjustment work or to the cost of materials and raw materials.

We consider it to be more valid if payment for earth removal was reflected in the cost of a product analogous to making payments for stripping operations. Consequently, expenditures for earth removal for the initial development of an open pit should be included in the estimated cost of construction analogous to expenses for initial stripping operations. All subsequent expenses for earth removal should be paid off, as are current stripping operations for preparing reserves, in proportion to the production output of an open pit.

Planning and calculating the cost of cement by types and grades and dividing expenses for maintaining production and management. It has been established by the Regulations for planning costs (point 83) that planning calculations are an important part of the technological-economic basis for planning based on cost and in current annual planning are compiled for all types of cement (with an indication of the grade composition and cost for 1 ton of cement of each grade).

The Regulations (2) also indicate that planning the cost of cement according to the grade, until a special method is developed, is being done according to letter No 1-8-23 dated 31 January 1966 from the Main Administration for the Cement Industry in the USSR Ministry of the Construction Materials Industry. In order to plan and calculate the actual cost of cement this letter proposed that the cost of 1 ton of cement of a given grade be determined by means of increasing its wholesale price by the expenditures for 1 ruble of commodity output according to the given type of cement. This signifies that calculation of the cost of cement by type is not based on actual expenditures but is done mechanically by means of dividing the total expenditures proportional to the wholesale prices of individual grades of cement.

Meanwhile high strength portland cement, grades 550 and 600, are singled out in a special form which requires a separate estimate of expenditures and calculations for the planned and actual costs.

According to the method now being used, the division of expenditures for the production of individual types and grades of cement will be identical, which does not reflect actual expenditures and hinders economic stimulation for the production of high strength cement.

In practice other methods of dividing expenditures are also being applied at cement enterprises to calculate the cost of cement according to types and grades.

Since a separate calculation for clinkers according to types and grades of cement has difficulties associated with it, plants generally redistribute expenses between the types and grades of cement according to the reallocation category "Grinding of cement" (the Zdobunov and Zhigulevsk combine and others). According to the Regulations it is suggested that expenditures for this reallocation category, based on the items "Wages for essential workers," "Expenses for maintenance and utilization of equipment," and shop expenses are to be divided in proportion to the machine-hours of work of a unit in the production of individual types and grades.

Although the consumption of machine time in producing (grinding) various types and grades of cement in a number of cases may be determined only by calculation methods (according to technological charts), this method is a more accurate basis for dividing expenses than are wages but is not universal since equipment yards at a majority of enterprises consist of various types of cement devices.

Therefore, enterprises prefer to divide expenses according to the reallocation category "Grinding of cement" not in proportion to the machine-hours of work for a unit but proportional to their specific productivity. For this purpose coefficients that reflect the productivity of equipment when grinding various types and grades of cement may be used. Together with this the productivity of a unit when grinding more bulky types of grade 400 portland cement with mineral admixtures should be taken as a unit.

In our opinion the above principle of dividing expenses may be applied not only for the reallocation category "Grinding of cement" but also for the technological reallocation categories which precede it.

Expenses for maintenance and utilization of equipment for each reallocation category (raw material admixtures, raw material powder, clinkers with various properties or composition and various types and grades of cement) are divided between the types of products (semi-finished)

proportional to the coefficient which reflects the productivity of equipment when producing a product (semi-finished) with varying properties (composition).

A valid, economically-based calculation for the cost of various types and grades of cement is possible only by means of strictly following the norms for equipment productivity, and consumption of fuel, electric power and materials which have been established by technological charts.

It is well known that high strength cement is obtained, as a rule, from clinkers that are fired in furnaces with relatively lower levels of productivity and a high consumption of fuel. For example, at the Zdolbunov cement-schistose combine, clinkers used in the production of grade 600 portland cement are obtained only from furnaces with dimensions of 3.6 x 118 meters and which have an average fuel consumption of 224.6 kg per ton (for furnaces with dimensions of 4.5 x 170 meters fuel consumption comprises 218.7 kg per ton). The price increase factors should be completely accounted for when calculating the cost of high grade portland cement.

In the Basic Principles (1) it is suggested that shop and general plant expenses be divided between product types in proportion to the total sum of wages for production workers and expenditures for maintenance and utilization of equipment. In the Regulations (2) shop expenses are divided between product types in proportion to the basic wages of production workers (point 41) and general plant expenses are divided in proportion to the sum of basic wages for production workers and expenses for maintenance and utilization of equipment. We believe that the first as well as the second should be divided identically as is recommended by the Basic Principles.

Improving the practice of planning, estimating and calculating the cost of a product in the cement industry will promote a further corroboration of economic calculations, the successful introduction of new technology and a valid determination of the cost of individual types and grades of cement.

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Cement Plant Machine Operators

Moscow STROITEL'NAYA GAZETA in Russian 27 Feb 80 p 2

[Article: "Machine Operators of 185 Meter Furnaces are Competing (Commentary on the Summary)"]

[Text] At the very beginning of the 10th Five-Year Plan all machine operators of the largest furnaces in the cement industry--185 meter rotary furnaces--entered into competition to completely utilize their designed capacities. Calculations made by specialists have shown that by strictly observing technological discipline, by carrying out planned maintenance on time, and by widely disseminating advanced labor methods, it is possible to obtain almost an additional million tons of cement annually.

The participants in the competition themselves--machine operators at Sebyakovskiy, Ust'-Yamenogorsk, Akmyane and a number of other enterprises--have proved in practice that the designed capacity of a furnace--600,000 tons of clinkers per year--may not only be reached but exceeded. "The conditions are created by the people themselves," affirmed one of the initiators of the competition, machine operator at the Sebyakovskiy plant--Hero of Socialist Labor, P. Mordvintsev. Together with machine operator-specialists at other plants he took part in the selection of the optimum stock components for the thermal and aerodynamic conditions of the work performed by 185 meter furnaces.

The common struggle of machine operators of the largest kilns took on the nature of a "relay race of workers" within the sector. It involved workers in mining, raw materials and grinding shops, maintenance personnel and associates in plant laboratories in the struggle to develop the capacities. At present cement workers, who service the new high output kilns that use a dry mode of production, are participating in this relay race.

Nevertheless, the problem raised by the machine operators has not been solved. In general, since the second half of 1977 a slump has begun in the work of the entire cement industry. Executives in the sector explained this as a chance phenomenon. The downturn in the first half of last year was attributed to the severe winter. However, as can be seen from the published summary this lag is assuming a chronic nature. Therefore, the editorial staff asked the deputy minister of the USSR Construction Materials Industry, V. Kushchidi, who is in charge of this subsector, to name the chief, and not the chance reasons, for the breakdown in which the cement industry now finds itself, to mention the measures to eliminate it and how the situation is being rectified since the beginning of the year.

"Last year," says V. Kushchidi, "under the most unfavorable conditions, 42 of the 79 plants under the jurisdiction of the USSR and Union Republic Construction Materials Industry fulfilled the plans for producing cement. The quality of the product improved. We now produce 9.6 percent more '500' grade cement than at the beginning of the five-year plan. We turn out 20 percent more quick-setting cement and double the amount of stressed cement. Every sixth ton of cement leaves with the Seal of Quality. Production of the '550' grade of cement has begun, etc."

"It goes without saying that all of this was not easily done. During the span of the entire preceding year, especially the first half, cement workers experienced great difficulties due to insufficient supplies of fuel and restrictions in electric service. For these reasons we lost much due to the idle time of furnaces. On the average their hourly productivity reached 98.8 percent of the plan yet the coefficient of utilization comprised only 0.735 as opposed to 0.9 in the plan. At the same time, for enterprises that were more or less satisfactorily provided with fuel, for example the Sebyakovskiy plant, the coefficient of utilization for the furnaces was 0.91.

"A number of enterprises experienced difficulty due to interruptions in raw material supplies, which was brought about, incidentally, not only because of a shortage of railroad cars. The lack of preparations of raw materials at the following places also had an adverse effect: the limestone quarry at the Checheno-Ingushskiy plant, the quarry in Starooskol'skiy, which yields slate that is rich in aluminate, and the clay quarries at the Karachayevo-Cherkessk plant and the "Mordovtsement" manufacturing association.

"The poor reliability of individual assemblies hinders the development of high capacity cement equipment: frames for 5 x 185 meter furnaces and cement grinders for 3.2 x 15 meter furnaces. For example, the operational time for the crown and sub-crown gears in the furnaces were 3 to 5 times lower than the norm! In addition, machine operators do a poor job of providing the sector with spare parts for this equipment.

"Structural work which is not sufficiently completed and the unreliability of equipment hinder the development of designed capacities and new technological lines operating by the dry method, which have furnaces with an output of 3,000 tons of clinkers per day. Four years have passed since the first such line was introduced at the Novo-Karagandinskiy plant. Soon after another four 95 meter giant kilns became operational in Spassk-Dal'nyy and Navoi. But not one has yet reached the design limit. A serious obstacle is the fact that the output of refractory materials used in these furnaces has still not been put in order, which adversely affects the sturdiness and the lining, and this means the coefficient of utilization as well.

"Job breakdowns are frequent at many plants in the sector. One of the reasons is the low qualifications of service personnel. The problem of acquiring staffs is very important for us. In this regard it would not be out of place to say that cement plants are not complicated to build as far as the system is concerned. They are put into operation without a required number of residents or social-cultural structures. Capital investments are not completely assimilated for housing construction. This impedes the acquisition of staff members who are capable of servicing complex equipment.

"The fact that cement workers are allocated half of the bulldozers, excavators and motor vehicles that are needed is also hindering our work.

"The USSR and Union Republic Ministries of Construction Materials are taking measures to correct the situation. We are making it a practice to conclude agreements between plants and institutes for scientific-production cooperation. At the end of last year complex measures were developed and approved which stipulate that the quality of manufactured industrial equipment is to be significantly improved and that production of new types of assemblies for the construction materials industry is to be adjusted during 1980-1985.

"At the present time fuel supplies have improved somewhat. In January cement workers turned out 2.1 million tons of cement more than during the same period last year. From the very first days of this year socialist competition has been developed to fittingly greet the 110th anniversary of the birth of V. I. Lenin. The tasks for this year are expressed in the socialist obligations of the initiators of the competition--the Angarsk cement workers. They summoned all collectives in the sector to turn 1980 into a year of accelerated work in the tradition of Lenin. This means to work without falling behind and with good technical-economic indices, to improve the quality of products, to reduce the consumption of raw materials, fuel and electricity and to accelerate the development of capacities.

"Competition is expanding among machine operators and other workers in the sector to complete personal five-year plan quotas."

We hope that the concluding year of the 10th Five-Year Plan will become the turning point in the efforts of the entire cement industry to develop the designed capacities of the largest kilns.

**HIGH CAPACITY FURNACES AT FULL CAPACITY!
1979 RESULTS**

Name of Enterprise	185 Meter Furnaces Number	Last Name of Machine Operators	Annual Output of Clinkers (thousands of tons)		Hourly Output (in tons)	Coefficient of Consumption	Specific Expenditure of fuel (in kg per 1 ton of clinkers)
			planned/actual				
ENTERPRISES UNDER REPUBLIC JURISDICTION							
Akmyane cement-schistose plant	5	I. Freymontas, Ya. Yushkis, F. Pretkelaytis, A. Vilimas.	573.1	573.2	72.6	0.901	221.9
	8	A. Shimutis, A. Zorkus, A. Statkus, I. Kyudulas.	572.9	573.1	72	0.909	221.9
	6	P. Tupikas, D. Lakavichus, P. Yankunas.	573.0	573.1	72	0.901	221.9
	7	L. Paulauskas, I. Ilonis, P. Dvarishkis, S. Ventskus.	552.9	553.0	72	0.877	221.9
Ol'shan plant	1	V. Matyukhin, I. Kandiral, V. Kashnikov, Ye. Gurov.	524.8	526.9	69.1	0.871	218.0
	2	A. Pugach, M. Vlasov, V. Brekhov, V. Pekin.	526.2	523.2	69.1	0.865	217.4
Balakleya cement-schistose plant	3	G. Pavlenko, V. Sushko.	531.5	511.4	69.7	0.84	220.5
	4	V. Bozhenko, V. Golozubov.	512.3	507.8	69.9	0.83	216.8
	2	Ye. Sazonovets, V. Oleynik.	522.6	509.0	68.1	0.85	224.6
	1	V. Koloyartsev, P. Pukhach.	519.4	493.8	68.9	0.82	224.6

Name of Enterprise	185 Meter Furnaces Number	Last Name of Machine Operators	Annual Output of Clinkers (thousands of tons)		Hourly Output (in tons)	Coefficient of Consumption	Specific Expenditure of Fuel (in kg per 1 ton of clinkers)
			planned/actual				
ENTERPRISES UNDER REPUBLIC JURISDICTION (continued)							
Amvrosiyevka cement-schistose combine	7	V. Kolesnik, M. Mokritskiy, A. Ivakhnenko, V. Mironov.	519.7	513.2	66.1	0.89	251.99
	8	P. Seleznev, I. Mikhaylenko, L. Postrybaylov, V. Boyev.	496.1	495.3	66.1	0.86	251.99
Kamenets-Podol'skiy plant	6	D. Kavetskiy, V. Pristanskov, V. Bagovetskiy, V. Kolousov.	528	500.4	69.3	0.82	227.3
	5	N. Sesyuk, Yu. Rozhkov, N. Gumenyuk, V. Bykov.	523.0	499.6	68.9	0.83	226.4
	1	S. Yakimov, B. Krymov, V. Zhilin, I. Matushchak.	514.0	497.8	69.2	0.82	226.5
	3	M. Dem'yanenko, A. Ganyuk, A. Prodan, A. Rudyak.	485.0	472.8	69.3	0.78	225.4
	2	V. Pustovoy, A. Sugak, S. Tanasov, V. Zyubritskiy.	492.0	450.1	68.9	0.75	227.7
	4	A. Bebikh, N. Mel'nichuk, A. Budzinskiy, N. Reshetnik.	507.0	450.1	69.4	0.74	225.9

Name of Enterprise	185 Meter Furnaces Number	Last Name of Machine Operators	Annual Output of Clinkers (thousands of tons)		Hourly Output (in tons)	Coefficient of Consumption	Specific Expenditure of Fuel (in kg per 1 ton of clinkers)
			planned/actual				
ENTERPRISES UNDER REPUBLIC JURISDICTION (continued)							
Ust'- Kamenogorsk plant	4	V. Kungurov, V. Kondrat'yev, N. Rudenko, N. Kovalenko.	515.6	515.7	72.4	0.813	235.6
	3	V. Sinitsyn, V. Stupakov, N. Sakovskiy, V. Sinel'nikov.	403.5	403.9	72.4	0.637	235.6
MAIN WESTERN CEMENT DIRECTORATE							
Sebryakov- skiy cement plant	7	P. Mordvintsev, V. Ignatov, A. Kiyevskiy, A. Peredunov.	583.0	590.1	73.6	0.91	216.6
"Novoros- tsement" and production association	8	N. Krapivkin,	1052.0	1033.4	72.1	0.82	186.9
	9	V. Stusov, V. Tokarev, M. Nebaba.					
"Bryansk- tsement" production association	9	A. Tret'yak, Ye. Khabarov, G. Krupkin, V. Lifshits.	464.4	477.4	67.5	0.81	245.9
	8	V. Fedorenkov, N. Bakhlayev, A. Zhuchenkov, V. Konovalov.	445.1	436.5	67.5	0.74	246.3
Shchurov- skiy cement plant	5	V. Kozlov, V. Kul'kov, A. Kalinkin, L. D'yachenko.	430.0	415.2	60.9	0.778	268.8
	6	M. Il'in, M. Sakharov, K. Balashov, V. Levagin.	421.5	388.8	61.9	0.715	268.8

Name of Enterprise	185 Meter Furnaces Number	Last Name of Machine Operators	Annual Output of Clinkers (thousands of tons)		Hourly Output (in tons)	Coefficient of Consumption	Specific Expenditure of Fuel (in kg per 1 ton of clinkers)
			planned/actual				
MAIN WESTERN CEMENT DIRECTORATE (continued)							
Starooskol'- skiy cement plant	3	L. Ishkov, V. Mukhin, V. Khol'tobin, V. Kuz'menko.	398.6	405.3	68	0.68	238.9
	1	V. Luchin, N. Kondratyuk, A. Chishin, L. Korshikov.	392.6	398.7	67.8	0.67	238.9
	6	S. Kudrin, A. Denisenko, I. Komarov, I. Guridov.	379.5	384.9	67.4	0.65	238.9
	4	M. Chekunov, V. Sotnikov, V. Novikov, A. Borisov.	396.2	379.7	69.0	0.63	238.9
	2	N. Zhilenkov, Yu. Shatokhin, A. Belikov, A. Vlasenko.	328.9	336.8	67.9	0.57	238.9
	5	I. Novikov, I. Yugov, V. Perepelyukov, S. Blonskiy.	302.2	306.5	65.7	0.53	238.9
Karachayevo- Cherkessk cement plant	1	A. Lezgin, V. Kutsevich, V. Vasilina, V. Kos'modem'yanskiy.	352.8	316.4	67.6	0.53	238.9
	4	V. Gorokhov, V. Yur'yev, V. Oreshin, A. Vasilevskiy.	298.1	307.7	64.3	0.546	239.2

Name of Enterprise	185 Meter Furnaces Number	Last Name of Machine Operators	Annual Output of Clinkers (thousands of tons)		Hourly Output (in tons)	Coefficient of Consumption	Specific Expenditure of Fuel (in kg per 1 ton of clinkers)
			planned/actual				
MAIN WESTERN CEMENT DIRECTORATE (continued)							
Karachayevo-Cherkessk cement plant	2	V. Kutsevich, V. Vasilina, M. Tkachev, V. Vasil'yev.	383.3	291.6	66.1	0.50	238.7
	3	V. Gorokhov, V. Yur'yev, N. Kretov, A. Vasilevskiy.	345.1	207.5	60.1	0.39	246.7
Checheno-Ingushskiy cement plant	2	A. Gorbunov, K. Maksimov, A. Khazhayev.	308.6	264.5	61.5	0.49	
	1	A. Romanov, A. Kashchenko, G. Gavrilov.	291.4	225.0	60	0.43	
MAIN EASTERN CEMENT DIRECTORATE							
"Sukholozh-tsement" combine	9	V. Kiselev, V. Skvortsov.	573.0	563.7	77.6	0.83	225.0
	8	S. Bykov, V. Cherdantsev.	515.5	491.2	70.8	0.79	222.1
	7	G. Rykovskiy, Yu. Chechenev, V. Demin, S. Dunchenkin.	490.7	489.2	70.5	0.79	222.1
Topkinskiy cement plant	6	N. Voronov, V. Shepetkin, V. Kokovin, V. Abramov	484.8	461.1	71.0	0.74	220.0
	3	A. Krotter, A. Prokhorov, V. Beloborodov, B. Aduyev.	496.5	492.8	68.9	0.81	237.5

Name of Enterprise	185 Meter Furnaces Number	Last Name of Machine Operators	Annual Output of Clinkers (thousands of tons)		Hourly Output (in tons)	Coefficient of Consumption	Specific Expenditure of Fuel (in kg per 1 ton of clinkers)
			planned/actual				
MAIN EASTERN CEMENT DIRECTORATE (continued)							
Topkinskiy cement plant	4	N. Baryshev, N. Mavropulos, V. Popov, S. Vagin.	468.2	456.7	69.3	0.75	237.5
	2	O. Yershov, Yu. Khazov, Ye. Kir'yak, I. Zaborchuk.	435.8	431.9	63.0	0.78	237.5
	1	V. Kuznetsov, V. Stasenko, A. Sokolov, Yu. Lesin.	414.4	413.4	62.3	0.75	237.5
"Vol'sktsement production association	8	P. Flegontov, Ye. Kapralov, V. Grigor'yev, G. Yepifanov.	435.0	438.4	66.8	0.75	229.6
	7	B. Yefremov, M. Khlebnikov, V. Grigor'yev, M. Glukhov.	440.3	420.6	68.0	0.71	229.6
	6	I. Kargin, A. Rogozhin, V. Matyasov, V. Platonov.	448.8	417.3	65.7	0.72	229.2
"Mordovtsement" production association	5	A. Volchek, V. Belov, I. Denisov, A. Funin.	426.8	414.4	64.4	0.73	248.7
	6	M. Vasil'yeva, A. Podkin, S. Tarasov, Ye. Petrunin.	463.5	410.0	64.7	0.71	248.7

Name of Enterprise	185 Meter Furnaces Number	Last Name of Machine Operators	Annual Output of Clinkers (thousands of tons)		Hourly Output (in tons)	Coefficient of Consumption	Specific Expenditure of Fuel (in kg per 1 ton of clinkers)
			planned/actual				
MAIN EASTERN CEMENT DIRECTORATE (continued)							
"Mordov- tsement" production association	7	P. Lyskov,	467.5	384.6	65.8	0.66	248.7
		V. Nyrkov,					
		V. Korneyev,					
		V. Shitikhin.					
Gornozavodsk cement plant	8	V. Prokin,	392.6	346.8	61.3	0.62	248.7
		Yu. Iyevlev,					
		Yu. Bobylev,					
		A. Stolyarov.					
	7	V. Kudrin,	474.4	414.2	68.9	0.68	230.8
		A. Pavlov,					
		V. Ogloblin,					
		V. Khlopotov.					
	6	A. Chernetsov,	441.9	393.9	68.7	0.69	230.1
		O. Lykasov,					
		V. Aleksandrov,					
		V. Panin.					

Problems at Plant

Moscow STROITEL'NAYA GAZETA in Russian 5 Mar 80 p 3

[Article by I. Akhmetov, correspondent of STROITEL'NAYA GAZETA in Navoi, in Bukharskaya Oblast: "Here is the Million; What is Impeding the Development of Design Capacities at the Cement Plant in Navoi"]

[Text] Four years have passed since a cement plant appeared on the steppe on the border of Kyzylkum near the city of Navoi. It is the largest in Central Asia. The first furnace was fired up in 1977; the second, a year later. The design capacity of the two technological lines, which comprise the first phase of the enterprise, is 2.3 million tons of cement per year.

The imposing dimensions of the industrial complex come into view on the road from Navoi to Bukhara. Two smoke stacks shoot up high into the sky. But what's this--is smoke coming out of only one? Do not think that the filters of the other one are operating perfectly and intercepting all of the dust. There is a different answer: the second technological line is not in operation. When we approached the plant grounds the second furnace also stopped "breathing"--some kind of breakdown. And this is at an enterprise with a continuous round-the-clock production cycle.

Plant operations are extremely unstable. Breakdowns that force emergency shutdowns are frequent. As a result, last year the average hourly production of furnace No 1 was 84.6 tons and furnace No 2 94 tons, as against 108.7 tons in the plan. The plant did not once fulfill the plan for the production of cement in three years and owes construction sites in Uzbekistan more than a million tons of products!

Why is the design capacity being developed so slowly?

It would be easy to shift the entire blame to plant workers. So much time has passed and they have not yet managed to develop the technological line to the design limit and do not even fulfill the understated plans.

Certainly the collective of the young enterprise has made many mistakes from the beginning. Management proved to be weak. At present the plant is headed by former First Deputy to the Minister of the Uzbekistan Construction Materials Industry, T. Tashpulatov, who was specially sent here. Many measures are being taken to improve plant operations and to increase the technological and professional level of Navoi cement workers. A skeleton of experienced workers has already been formed at the enterprise. Local party agencies and the Republic Ministry of the Construction Materials Industry have begun to pay more attention to the Navoi plant.

Even so the productivity level of the plant has still not been able to be raised.

Specialists do not differ in their opinions as to what is hampering matters. First of all, there are serious design and structural flaws. Secondly, strange as it may seem, the plant was put into operation without a maintenance base. Thirdly, there are deficiencies in organizing workers' living conditions.

The general designer--the Kharkov Southern Hydrocement Institute--permitted many glaring errors in the design. But, while admitting these errors, the chief project engineer, A. Starosotskiy, justifies them by pointing to the experimental nature of the enterprise where the more effective dry method of producing cement was introduced for the first time in the country.

Yes, both furnaces in Navoi are experimental. But it is not possible to write off all design errors by pointing to this; too many were permitted. It is costing the state a pretty penny to eliminate them. The price increase over the initial estimated cost for the plant has already passed 10 million rubles.

In what way are the design omissions manifest? Let's listen to engineer V. Ivanitskiy on that score, who is the supervisor in charge of the work to eliminate the designers' errors. He is speaking about the poor work which is done by the equipment on the second technological line. But the very same deficiencies are characteristic for the first line as well.

"Observation of the operations of the furnace have shown," he says "that the smoke suction devices are not providing the aerodynamic conditions which are specified by the design for the furnace and the cyclone heat exchanger. Due to this, there are a significant amount of emergency shutdowns and sluggish rates of work. During the process of further use the operations of the cyclone heat exchanger deteriorated. The furnace had to be shut down for reconstruction...."

Today, 1100 persons work at the cement plant. According to the labor plan there should be 250 more. One of the reasons for the shortage of personnel is the lack of housing. At present, 370 workers are in line to receive apartments. However, no more than 70 will receive them this year. The contractor--the Navoi Construction Administration--is not undertaking to erect more dwellings although the client has sufficient funds. However, at neighboring enterprises which are also comparatively young--an electrochemical combine and GRES [State Regional Electric Power Station]--similar problems do not arise. In addition, they have dispensaries, kindergartens and other institutions for social, cultural and service use which, alas, the cement plant does not have.

Extensive measures have been worked out at the enterprise to ensure that both technological lines will operate consistently and that their designed capacities will be developed. The measures were approved by union and republic ministries of the construction materials industry. Corresponding services in the USSR Ministry of Construction Materials do not know, for example, how to treat the requests of the enterprise for complete spare parts for cement equipment. The Navoi Construction Administration is doing a poor job of building a maintenance base as well as a silo warehouse for lime and a schist crushing department. Gosnab is delaying the distribution of machinery and mechanisms which are extremely necessary for normal enterprise operations.

METALWORKING EQUIPMENT

MACHINE-BUILDING INDUSTRY'S MINISTER OUTLINES FUTURE DIRECTIONS

Moscow IZVESTIYA in Russian 16 Mar 80 p 2

[Article by A. Kostousov, minister of USSR Machine Tool and Tool Building Industry: "Important Machine Tool Building Tasks"]

[Text] Among those industrial branches which determine technical progress in the national economy, a special place is quite properly occupied by the machine tool and tool building industry. The effectiveness of the work being performed by our plants and factories, the quality of the products being produced by them and the technical and economic parameters of these products are all dependent to a considerable degree upon this industry. One of the most vital tasks at the present time is that of further developing the machine building and metal working industries. Where a problem exists with regard to the availability of labor resources, this task can only be solved through the introduction into production operations of more improved and highly productive equipment and a progressive technology. And here our branch has the final say.

Even during the Tenth Five-Year Plan, a trend was noted towards changes in the structure of the equipment being produced and the manufacturing of more productive types of equipment. For example, as the overall production of machine tools increases by 6.4 percent above the figure for the Ninth Five-Year Plan, the production of special, specialized, unitized, high-precision, heavy-duty and unique machine tools and also automatic machines, semi-automatic machines and automatic lines increases from 25 to 60 percent and the production of machine tools having digital programmed control will increase by more than twofold. A considerable increase took place in the production of modern forge and pressing, casting and wood working equipment and instruments.

During the current five-year plan, the proportion of high quality products increased by more than four times compared to the figure for 1975. Today the honorary pentagon marking is found on 1,300 products, including 403 metal cutting machine tools.

Nevertheless, despite the definite successes achieved, the work being carried out by the branch is in need of serious improvement. In 1979, for

the first time during the post-war period, the industry of Minstankoprom [USSR Machine Tool and Tool Building Industry] failed to fulfill its state plan. This is explained first of all by shortcomings in the organization of production control and by disruptions in planning and production discipline. During the November (1979) Plenum of the CPSU Central Committee, Comrade L.I. Brezhnev stated: "By no means were all of the ministries and departments able to overcome the forces of inertia, decisively improve the situation with regard to work quality, raise labor productivity or achieve the best final results." This statement fully applies to the machine tool and tool building industry. Many of our workers possess a lowered sense of responsibility for fulfillment of the plan. Moreover, it is no longer fashionable to explain one's shortcomings in terms of insufficient material-technical supply. Meanwhile, a considerable amount of working time is being expended in an unproductive manner at enterprises of the branch and personnel turnover is still considerable.

Many complaints have been addressed against the builders. During the Ninth and 4 years of the Tenth Five-Year Plan, not one construction ministry succeeded in fulfilling its annual plan at our projects. As a result, the plans for placing production capabilities in operation were disrupted and the national economy failed to receive many machine tools, forge and pressing machines, automatic lines and metal working instruments.

Today we are experiencing an acute shortage of personnel, especially at new enterprises. Meanwhile, of 14,000 young workers who graduate annually from professional-technical schools of the ministry, almost one third are assigned to enterprises of other branches by the State Committee for Professional Technical Education. We consider this action to be incorrect.

From year to year, the requirement for specialists possessing a higher education is being satisfied by no more than 75 percent and for such specialties as "automatic control systems," "automation and telemechanics" and "industrial electronics," by only 45-60 percent. It is our opinion that the Ministry of Higher Educational Institutes should study the proposals for organizing training for engineers in the specializations "machine building technology," "metal cutting machine tools" and instrument production at the Belorussian, Leningrad, Odessa, Tula, Ul'yanovsk and Tbilisi polytechnical institutes and at the Novosibirsk Electrical Engineering and certain other institutes. This would aid noticeably in reducing the severity of the problem.

One of the main tasks confronting the branch at the present time is that of implementing improvements in the construction of the machine tools, equipment and instruments. During the November (1979) Plenum of the CPSU Central Committee, it was noted that the metal consumption of many machines being produced throughout the country has been raised in an unjustified manner. In order to eliminate this shortcoming, welded structures must be introduced on a more extensive scale. At the Institute imeni Ye. Paton, in response to our request, a technology was developed for welding more than 200 types of framework parts. With the aid of specialists from this

institute, the welding of unique parts was mastered at the Kolomna plant for heavy-duty machine tools, the Novosibirsk "Tyazhtankogidropress" plant, the Kramatorsk plant for heavy-duty machine tool building and at a number of other facilities. Moreover, the weight of the parts is decreasing by 20-25 percent and the labor-intensiveness of their mechanical processing is also decreasing. This progressive technology will be disseminated extensively throughout the branch.

A substantial savings in metal is being achieved through the use of appropriate shapes of rolled metal. Thus the use of gauged rolled metal for motion screws ensures a savings of metal in excess of 20 percent. The metallurgists must satisfy more completely the requirements of the machine tool builders for special types of rolled metal.

Radical improvements are required in the work being performed by the design organizations. We are striving to raise the role and responsibility of the designers for the technical level and quality of the machines created by them. At the same time, the specialists must be released from having to carry out unnecessary coordination and all bureaucratic obstacles must be removed. Technical documentation is being developed annually in our branch for several thousands of types of items. At the same time, the designers are expending 350,000 man-hours annually in the coordination of technical conditions. According to estimates, the introduction of reasonable simplifications in this work will make it possible to lower the labor-intensiveness of design work for one machine tool to 1,500 man-hours. On the branch scale, this is equivalent to the volume of work which 2,000 designers can carry out in a year's time.

The creation of new equipment is slowing down noticeably owing to the existing method for coordinating the use of completion items and materials, as defined by USSR Gossnab in 1976. Here is just one example. Last year, Minstankoprom received 580 orders from enterprises and organizations, with a request for authorization to use deficit non-ferrous metals. Of this number, the ministry sent 385 of the orders to the inter-departmental committee of USSR Gossnab for coordination. They were examined in advance by our branch institutes. In turn, the inter-departmental committee sent the orders to the Giprotsvetmetobrabotka Institute for a decision to be made on them. The amount of documentation required by this institute is on the order of 150-170 sheets of paper for each order. During 1979 alone, more than 47,000 sheets of documentation were forwarded to Giprotsvetmetobrabotka in behalf of 385 orders. The coordination procedure for each order lasts from 4 to 6 months.

The designers of the machine tool building industry spend a great amount of time attempting to obtain permission to use non-ferrous rolled metal, despite the fact that the total requirements of Minstankoprom for such metal constitute just slightly more than one half percent of its production throughout the country.

Our designers harbor serious complaints with regard to the quality and reliability of the hydraulic and electrical equipment and rubber products.

Up until recently, the designs for machine tools having digital programmed control included the use of an obsolete element base and cumbersome metal-consuming mechanical drives of the principal movement and supply, while at the same time the best foreign firms had converted over almost completely to a direct current regulated electric drive.

There are many other unresolved problems. A great deal is dependent upon ourselves and much upon related workers. A large complex of problems must be solved if the branch is to be numbered among the leading branches. All of us welcomed with a great deal of satisfaction the recent decree of the CPSU Central Committee and the USSR Council of Ministers "On Raising Considerably the Technical Level and Competitive Capability of the Metal-Working, Casting and Wood-Working Equipment and Instruments." The role to be played by the machine tool and tool building industry, as the basis for raising the efficiency of all machine-building production, was clearly defined in this decree. For the very first time, the machine tool builders were provided with a program calling for the complex development of all elements of the branch. Measures were defined in this program for raising the branch to a higher level.

In connection with the decree adopted in the CPSU Central Committee, a meeting was recently held for workers in the machine tool and tool building industry. During this meeting, the tasks of branch workers associated with further improving domestic machine tool building were examined. These tasks are complicated and a great amount of tense effort and work is required if they are to be solved.

The plans call for a further and considerable increase in the production of highly productive equipment. The production of automatic lines for machine-building will increase by 40 percent, automatic and semi-automatic machines for all technological groups -- by more than 58 percent, special and unitized machine tools -- by almost one third, machine tools with digital programmed control -- by 2.5 times, forge and pressing automatic machines -- by more than twofold and machines having programmed control -- by 3.3 times. The production of casting equipment of all types is to be increased by more than 70 percent and equipment having programmed control for wood-working -- by threefold.

The plans call for the production of manipulators for metal-cutting equipment to commence. The development of a correct technical policy for their production and the preparation of manipulator designs for various technological operations, based upon unitized units, will be of priority importance. The construction of three plants for the production of the manipulators, as called for in the decree, is a decisive factor for ensuring their series production.

The decree of the CPSU Central Committee and the USSR Council of Ministers calls for the priority development of the production of the more improved types of instruments. In conformity with this, the plans call for the

production of instruments equipped with faceted blades to be increased by 2.3 times, instruments with blades covered by wear-resistant materials -- by 9.2 times, instruments with blades made out of polycrystal diamonds, boron nitride and other superhard materials -- by two times and instruments for machine tools having digital programmed control and automatic lines -- by 3.2 times. Unfortunately, the production of high quality instruments is being held back by a lack of hard alloys and high-speed steels, especially those alloyed with cobalt or molybdenum. Indeed, estimates have shown that the proper use in industry of the modern equipment and instruments to be produced during the Eleventh Five-Year Plan will reduce the manpower requirements by 2 million workers, including 1.3 million machine tool operators representing a wage fund in excess of 5 billion rubles. Moreover, it will make it possible to realize a savings of 1.5-1.6 million tons of metal.

The branch has been assigned the following task: to raise labor productivity at newly built and modernized enterprises by 1.5-2 times above the figure achieved at existing plants. In order to solve this task, we must develop and master a basically new technology, achieve increased specialization and ensure a higher level for production organization. The fulfillment of the complex of operations called for in the decree, for the radical modernization and technical re-equipping of the machine tool and instrument industry of Leningrad, serves as a serious check upon our ability to solve this very important task. Over the course of two and a half to three years, tens of scientific-research and planning-technological institutes similar to our own and other branches of industry have developed the principal trends to be followed for solving this problem. As a result, the machine tool and instrument building associations and plants of Leningrad must increase their production of marketable products by 2.7 times, while simultaneously reducing the number of workers by 3,000 persons and raise labor productivity by 2.2 times while realizing a considerable improvement in the structure of the products being produced: for an overall increase in the production of metal cutting machine tools of 1.9 times, the production of machine tools having digital programmed control must be increased by 3.9 times.

The decree of the CPSU Central Committee and the USSR Council of Ministers called for solutions to be found within the branch for the large-scale tasks of a socio-domestic nature. Approximately 700 million rubles must be allocated for this purpose.

The workers of the machine tool and instrument building industry welcomed the decree with a great amount of enthusiasm and a sense of profound gratitude towards the CPSU Central Committee and the Soviet Government. They are fully resolved to respond to the concern displayed by the part by performing a greater amount of work and by further raising the efficiency and quality of their work. In commemoration of the 110th anniversary of the birth of Vladimir Il'ich Lenin, the collectives of all of the enterprises and organizations of Minstankoprom adopted raised socialist obligations.

The branch workers are holding firmly to a course aimed at achieving a difficult and noble goal -- creating machines and instruments that will enable our entire Soviet industry to take a decisive step forward.

METALWORKING EQUIPMENT

CAPITAL INVESTMENTS YIELD, ADVANCES DISCUSSED

UDC 621.9.08.338

Capital Investments Yield

Kiev TEKHOLOGIYA I ORGANIZATSIYA PROIZVODSTVA in Russian No 1, Jan 80
pp 8-10

[Article by P. M. Baltaksa, V. S. Gardash, N. P. Frolova, and L. G. Antonova, engineers, Dnepropetrovsk Metallurgical Equipment Plant, Kramatorsk Scientific Research, Planning and Technological Institute of Machine Building: "Analysis of Factors Affecting the Level of the Capital Investments Yield"]

[Text] The Dnepropetrovsk Metallurgical Equipment Plant (DZMO) together with the Kramatorsk Scientific Research, Planning and Technological Institute of Machine Building carried out a comparative interplant analysis of the capital investments yield. The South Urals Machine Building Plant and the Elektrostal' Heavy Machine Building Plant were taken for comparison.

The potentials for an increase in the efficiency of fixed capital at DZMO and the compared plants were examined in the totality of factors depending and not depending on the results of activity of the enterprise personnel. The following were taken as the basic factors for analysis: the change in the assortment of output, prices, profitability, level of cooperation, specialization and productivity of labor, structure of fixed capital, level of extensive and intensive utilization of equipment and magnitude (value) of fixed capital and the mastering of capacities in the commissioned facilities.

The actual increase in the capital investments yield during the analyzed year, as compared with the base year, totaled 1 kopeck and, according to the sum of analyzed factors, the proportion of increase totaled 0.96 kopecks. The performed calculation of the change in the capital investments yield according to the indicator of normative net output also confirms the objective effect of the taken factors on the indicator of the capital

investments yield. During the analyzed period the capital investments yield calculated according to normative net output remained at the level of the base year and totaled 38 kopecks at DZMO. According to the sum of analyzed factors the indicator of the capital investments yield did not change either, that is, the basic groups of factors taken for analysis were chosen correctly.

On the basis of the performed analysis the following basic patterns in the change in the capital investments yield at the plant were determined:

Labor productivity growth, which took place in all the shops of basic production, was the main factor determining the increase in the capital investments yield. Throughout the plant the capital investments yield due to this factor increased by 6.4 kopecks, which was the consequence of the wide introduction of new equipment, advanced techniques, tools and progressive forms of labor organization. At the plant there are more than 220 brigades, in which about 3,000 people work. A total of 66 organizational and technical measures with an annual saving of 600,000 rubles were introduced at the plant in 1978 alone. The most efficient measures of an organizational nature were reflected in the system of efficient utilization of labor resources and fixed and circulating capital formed at the plant.

An improvement in the level of extensive utilization of equipment had a positive effect on the change in the capital investments yield. For example, during the analyzed period, as compared with the base period, equipment downtime was shortened by 4.7 percent, the worked time of a unit of equipment increased by 234 hours and the shift coefficient of metal-cutting equipment rose, as a result of which the capital investments yield due to this factor increased by 5 kopecks. However, despite some positive results in the utilization and loading of equipment, equipment downtime at the plant is highly perceptible and, as the analysis showed, is one of the factors in the increase in the capital investments yield.

Some reduction in the capital investments yield resulted from the level of intensive utilization of metalcutting equipment, which determines the plant capacity. The intensity of equipment operation is characterized by its productivity per unit of time. Since DZMO is a plant with an extensive list of produced articles and with a large number of various types and sizes of manufactured parts, where hundreds of thousands of various operations are performed, under these conditions the level of intensive utilization of equipment, ultimately, can be characterized by the machine intensiveness of articles manufactured on this equipment. In this case the higher the productivity of equipment, the lesser the time spent on the manufacture of articles. Therefore, a reduction in the machine tool intensiveness of output is the basic factor in the increase in the intensive utilization of equipment. In turn, the labor and machine tool intensiveness of output is determined by the level of progressiveness of the used techniques and of the mechanization and automation of production

processes, by the technical state of equipment and by the degree of its provision with attachments and advanced tools. However, apart from technical reasons, factors of an individual nature, such as the volume and assortment shifts in the products list and so forth, have a significant effect on the total magnitude of labor intensiveness.

There is a definite relationship among the change in the products list, machine tool intensiveness, that is, the number of machine tool hours spent on the manufacture of articles, and the magnitude of the capital investments yield. The specific machine tool intensiveness of individual groups of listed products, especially metallurgical equipment, as well as car dumpers, is comparatively high for the plant. For example, whereas throughout the plant the specific machine tool intensiveness of 1 ton of articles, including tubing treatment, is 6.9 machine tool hours, the machine tool intensiveness of rolled metal equipment is 17.5 and of car dumpers 21.5 machine tool hours. The change in the structure of output in 1977 toward an increase in the volumes of more labor intensive products had a significant effect on the indicator of the capital investments yield. For example, in 1977 the output of articles throughout the plant increased by 107.5 percent, of labor intensive rolled metal equipment, by 129.2 percent and of car dumpers, by 122.9 percent, that is, there was an outstripping growth of the output of more labor intensive products. Large-scale work on lowering the labor intensiveness of output was done at the plant in 1977. In practice, all industrial processes were revised. The assignments for lowering labor intensiveness were fulfilled by all production subdivisions.

The labor intensiveness of basic articles, such as car dumpers, slag cars, ground-type charging machines and so forth, was lowered considerably.

However, the rates of reduction in the labor intensiveness of output resulting from the developed and introduced organizational and technical measures were slightly lower than the increase in labor intensiveness due to assortment shifts, as a result of which the general and specific machine tool intensiveness of articles grew, which brought about a reduction of 7.60 kopecks in the capital investments yield throughout the plant. To reduce machine tool intensiveness, it is necessary to develop and introduce advanced techniques and tools, as well as scientific organization of labor for an improvement in the utilization of machine tools and equipment.

The low capacity factor in newly commissioned projects was no less important a reason for the slowdown in the general increase in the capital investments yield. The capital investments yield takes on maximum significance (other things being equal) if the capacity factor approaches a unit. However, the factor of disproportionate (incomplete) commissioning of capacities and fixed capital has a very perceptible effect on the dynamics of the capital investments yield at the plant. DZMO is at the stage of reconstruction. Therefore, disorders and unfinished work of construction

and installation organizations lead to the fact that the commissioning of production projects lags behind schedules and in most cases occurs at the end of the year under review without an appropriate increase in output. Despite the increase in 1978 in the coefficient of utilization of existing capacities, owing to the disproportionate commissioning of new capacities and fixed capital, throughout the plant the capital investments yield was reduced by 5.3 kopecks.

The performed analysis of the capital investments yield made it possible to disclose the most significant aspects of the formation of the indicator of the capital investments yield, as well as to improve the utilization of existing capacities.

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Effect of Scientific Advances

Moscow MASHINOSTROITEL' in Russian No 12, 1979 pp 17-18, 20

[Article by Candidate of Technical Sciences V. V. Voskresenkiy and A. A. Maksyutov: "The Effect of Scientific and Technical Progress on Improvement in the Utilization of Capital and Increase in the Capital Investments Yield"]

[Text] An increase in the efficiency of industrial production is the basic problem of the economic strategy and tactics of the CPSU at the present stage. The decree of the CPSU Central Committee and the USSR Council of Ministers on improving the economic mechanism stresses the following: "The task is to raise the level of planning and management, to bring them in correspondence with the demands of the present stage, that is, the stage of developed socialism, to attain a significant increase in the efficiency of public production, acceleration of scientific and technical progress, labor productivity growth and improvement in the quality of output and on this basis to ensure a steady advance of the country's economy and of the well-being of the Soviet people." Acceleration of the intensification of all national economic units on the basis of reorientation toward qualitative factors in economic growth is the central core of the further increase in the efficiency of the economic mechanism. The rates of intensification of public production are largely determined by the rates of growth of machine building, which, steadily improving means of labor, raises the technical level of all production sectors.

Among the indicators of the efficiency of industrial production such indicators as labor productivity, capital-labor ratio and capital investments yield occupy the central place. The levels of these indicators are determined in large measure by the speed of introduction of the achievements of scientific and technical progress into material production.

From the national economic point of view the economic potential of Soviet science represents a big magnitude.

In our country the number of scientific workers is growing continuously (now it comprises 25 percent of the world level) and the expenditures on science are increasing (in 1977 they reached 18.3 billion rubles). However, the productivity of scientific labor in our country is still quite low. For example, at the end of the 1960's it comprised 68 percent of the world level and approximately 50 percent of the level in the United States. Such a situation has a negative effect on the level of productivity of national labor.

Under present conditions the rates of labor productivity growth are determined by the rates and speed of introduction of the results of scientific and technical progress into material production. Hence the task to sharply increase the yield on science in the national economy.

The intensification of all the subsystems of the national economy, especially of the "scientific and technical progress" subsystem, was transformed into the most powerful moving force of social development. Scientific and technical progress is manifested in material production in the form of a progressive reduction of labor expenditures on output. A rise in the technical level of production and an increase in the machine intensiveness of the national product now appear as the main direct factors in the growth of labor productivity, which means of the economic potential of the national economy as well.

The intensification of material production on the basis of acceleration of scientific and technical progress in our country is also due to such a factor as a gradual reduction in the increase in labor resources.

Scientific and technical progress fundamentally changes the quality and quantity of the used means of production, including means of labor, on the degree of utilization of which its productivity depends directly. To illustrate the above-stated, data on the number of some models of new equipment developed in the USSR during the last decades are presented in table 1.

Scientific and technical progress determines a rise in the technical level of production, which directly appears as the basic factor in labor productivity growth. In fact, the development of new means and subjects of labor brings about a rise in the level of the capital-labor ratio and capital investments yield in industrial production and this leads to an increase in labor productivity. The evaluation of the technical level of manufactured machinery and equipment made by the USSR State Committee for Science and Technology together with ministries and departments in 1979-1980, as well as its constant revision, subsequently will have a favorable effect on the dynamics of labor productivity both in machine building and throughout the industry.

Table 1*

Type of Equipment	1956-1960	1971-1975	1976-1977
Total	12902	20006	7272
Machinery, equipment and apparatus	10576	15190	5418
Including:			
power equipment	320	322	95
electrical equipment	900	2645	899
metalcutting lathes	1258	1872	708
forging and pressing equipment	512	536	204
transport and transport lifting equipment	678	674	225
motor vehicles, tractors and motor vehicle and tractor equipment	260	232	47

*"Narodnoye Khozyaystvo SSSR v 1977" [USSR National Economy in 1977], Moscow, 1978, pp 98-99.

It should be noted that machine building, as compared with some national economic sectors, such as ferrous metallurgy, electric power engineering, and fuel, chemical and petrochemical industries, is characterized by the highest rates of labor productivity growth.

For example, labor productivity in machine building in 1970, as compared to 1965, reached 149 percent, in 1975, 229 percent and in 1977, 266 percent, whereas throughout the industry this indicator was 132, 177 and 190 percent respectively.

It is well known that the rates of labor productivity growth in basic and auxiliary production are not the same. This is due to the fact that, owing to the established traditions, the mechanization and automation of production processes were carried out primarily in basic production and at auxiliary operations the increase in the volume of work was attained mainly as a result of a rise in the number of workers.

Data on the correlation of the number of basic and auxiliary workers in industry engaged in mechanized and manual labor in 1975 are presented in table 2. From this table it is evident that the mechanization of labor of basic workers is approximately 2.3 times as high as that of auxiliary workers.

At present our industry does not manufacture a sufficient amount of highly productive, new equipment for the mechanization and automation of auxiliary and subsidiary operations, including transport lifting machines and mechanisms. Meanwhile, according to the data of the Scientific Research Institute of Labor, expenditures totaling 1 million rubles on the mechanization of work disengage 4 to 5 times as many workers in auxiliary production as in basic production.

Table 2

Performed Operation	Number of Workers, %		
	Total	Basic	Auxiliary
By means of machines and mechanisms, as well as for observation of the operation of automatic machines	45.5	62.4	27.6
Manual:			
with machines and mechanisms	7.3	8.2	6.3
not with machines and mechanisms	34.6	28.9	40.6
for the repair and adjustment of machines and mechanisms	12.6	0.5	25.5

For the purpose of carrying out overall mechanization and automation of auxiliary production, some production and scientific production associations, scientific research institutes and design offices should be specialized in the development and manufacture of the equipment necessary for this. The introduction, among other approved indicators, of the assignment for reducing manual labor in industrial production will be a positive step.

The capital-labor ratio is one of the main indicators of the technical level of production. This indicator has a tendency toward a constant growth.

For example, as compared with 1970, the capital-labor ratio of the industrial and production personnel throughout the industry increased by 42 percent in 1975 and by 62 percent in 1977, while labor productivity growth was 34 and 44 percent respectively. Thus, the rates of increase in the capital-labor ratio outstripped the rates of growth of its productivity. In 1975 a total of 1 percent of labor productivity growth accounted for 1.06 percent of the increase in the capital-labor ratio and in 1977, for 1.12 percent.

A more progressive correlation between the rates of labor productivity growth and the capital-labor ratio is observed in machine building and metalworking.

As compared with the base period, the capital-labor ratio increased there by 41 percent in 1975 and by 64 percent in 1977 and labor productivity rose by 51 and 73 percent respectively, that is, in 1975 a total of 1 percent of labor productivity growth accounted for 0.93 percent of the increase in the capital-labor ratio and in 1977, for 0.95 percent.

The highest level of efficiency of utilization of fixed capital is noted and a capital intensive process takes place in this sector. However, the level of capital intensification has decreased slightly there in the

last few years. In 1975 a total of 1 percent of the increase in the capital-labor ratio accounted for 1.07 percent of labor productivity growth and in 1977, for 1.05 percent. Hence the important task to stop the drop in the level of the capital-labor ratio in machine building and metalworking, which will contribute to the further intensification of production.

Under the conditions of an intensive introduction of the achievements of scientific and technical progress into production the rates of labor productivity growth should outstrip the rates of increase in the capital-labor ratio in accordance with the rise in the level of the capital investments yield.

Between the rise in the level of the capital investments yield and in the level of labor productivity it is impossible to establish a strict, quantitatively measured relationship, because many factors, that is, the proportion of the active part of fixed capital, rates of its replacement, coefficient of equipment utilization, extensive and intensive loading of equipment and production areas and so forth, affect the indicator of the capital investments yield.

The indicator of the capital investments yield Φ_0 is determined by the ratio of the value of output W to the value of fixed capital S_0 :

$$\Phi_0 = W : S_0$$

However, this indicator largely depends on the method according to which the indicator of the capital investments yield is measured (according to gross, commodity or net output), as well as on the dynamics of the prices of fixed capital.

The production of means of labor under the conditions of scientific and technical progress should be accompanied by a reduction in the value of a unit of capacity of new equipment.

Meanwhile, in our country the value of equipment per unit of capacity (or unit of use value), as a rule, increases constantly. For example, from 1961 through 1970 the cost of metallurgical equipment rose by 15 to 25 percent and of textile equipment, by an average of 10 to 15 percent.

The results of factor analysis of the dynamics of the capital investments yield have shown that a drop in its level is largely connected with an increase in the value of fixed capital.

Among the factors in the direct effect of scientific and technical progress on industrial production the factor "rise in the technical level of production" is the main one. According to the data of Soviet economists, the increase in labor productivity due to technical progress comprises 60 percent.

Technical progress is accompanied by a constant increase in the science intensiveness of industrial production. Integration of science and material production along the path of formation of production and scientific production associations in industry contributes to this process.

For example, from 1970 through 1977 their number increased from 608 to 3,670 units, that is, more than sixfold and the proportion of production and scientific production associations in industry according to the volume of sold output increased from 6.7 to 44.3 percent and according to the size of the industrial and production personnel, from 6.2 to 45 percent.

As a rule, an increase in the science intensiveness of production leads to a rise in the qualitative and quantitative indicators of the capital-labor ratio. The use in production of means of labor of an increased (aggregate) concentration can serve as an example of its qualitative rise.

For example, whereas previously a worker performed drilling and cutting operations on two machine tools, with the increase in aggregate concentration he performs the indicated operations on one machine tool. At the same time, losses of work time on rearranging a part, adjusting machine tools and so forth are eliminated.

Labor productivity Π_T is determined as the product of the investments yield of fixed capital Φ_0 and of the capital-labor ratio Φ_B :

$$\Pi_T = \Phi_0 \Phi_B$$

In general, labor productivity will rise with the following correlations of the capital-labor ratio and capital investments yield:

When both indicators rise;

when one of the indicators is equal to or higher than a unit and another rises;

when one of the indicators is lowered and another is increased according to its numerical value by a magnitude greater than that by which the first is lowered.

In machine building and metalworking the dynamics of the capital investments yield is more progressive than throughout industry.

As compared with 1970, in 1975, 1976 and 1977 this indicator comprised 95, 92 and 91 percent throughout industry and 107, 106 and 106 percent in machine building and metalworking.

The general trend in our industry, including machine building and metalworking, is such that an increase in labor productivity is attained primarily by higher rates of rise in the level of the capital-labor ratio* as compared with the rates of rise in the level of the capital investments yield. However, such a situation is not advantageous for society.

In fact, the level of the capital-labor ratio characterizes the extensive aspect of utilization of fixed productive capital and the level of the capital investments yield, its intensive aspect. When the level of intensiveness of the utilization of fixed capital, in particular the indicator of the capital investments yield, is lowered, in order to maintain the progressive level of labor productivity, society is forced to resort to the extensive growth factor, that is, increase in the capital-labor ratio, which from national economic standpoints causes an increase in the replacement fund in the combined (gross) social product with a simultaneous reduction in the amount of the national income.

Two types of production intensification, that is, fund saving and fund increasing types, are distinguished in the present economic literature.

The outstripping growth of labor productivity as compared with an increase in the capital-output ratio (with a capital investments yield higher than a unit) is the basic sign of the fund saving form of expanded reproduction. However, if labor productivity increases by a magnitude lower than determined by the rise in the level of the capital-labor ratio (with a decreasing level of the capital investments yield), the fund increasing form of the intensive trend in production development is present. In machine building and metalworking in 1970-1977 the indicator of the capital investments yield was higher than a unit. Therefore, the fund saving form of production intensification is present here.

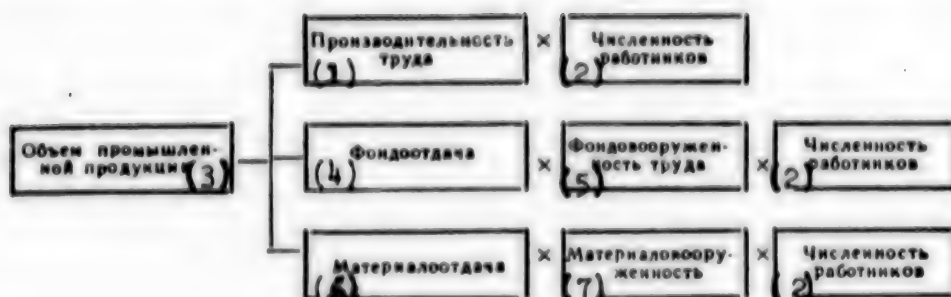
In general, the effect of intensive and extensive factors in economic growth on the volume of industrial output can be presented in the form of a diagram /see following page/.

This diagram shows that orientation toward production intensification presupposes primarily an increased attention to such indicators as labor productivity, capital investments yield and yield on materials. The 24th CPSU Congress noted that the essence of the problem of increase in production efficiency is to attain a significant increase in the volume of production and national income per unit of expenditures--labor, material and financial.

*Numerical data on the dynamics of the indicators of the capital-labor ratio and labor productivity during the indicated period were presented above.

Intensive factors

Extensive factors



Key:

- | | |
|--------------------------------|-------------------------|
| 1. Labor productivity | 5. Capital-labor ratio |
| 2. Number of workers | 6. Materials yield |
| 3. Volume of industrial output | 7. Material-labor ratio |
| 4. Capital investments yield | |

An analysis of some basic indicators of the economic efficiency of machine building production makes it possible to disclose the basic trends in its further intensification.

For the most part, extensive factors in economic growth connected with the enlistment of additional manpower have been exhausted. In connection with this production intensification on the basis of an accelerated introduction of the results of scientific and technical progress was transformed into the main factor in the economic growth of productive forces in machine building.

Acceleration of the rates of integration of science with production along the formation of scientific production associations in industry is the most effective form of linking labor and means of production at the present stage.

Increase in the output of transport lifting machines and small-scale mechanization equipment, especially for auxiliary production, is the most acute problem in production development.

Intensification in the use of fixed productive capital presupposes an increase in production efficiency not only as a result of an increase in the capital-labor ratio, but also in the level of the capital investments yield. The higher the rates of its increase, the higher the rates of labor productivity growth.

Acceleration of the process of intensification of machine building production will largely determine the further economic progress of the entire national economy along the path of attainment of the maximum final national economic results. The decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Intensifying the Effect of the Economic Mechanism on an Increase in the Efficiency of Production and Quality of Work" aims at this.

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METALWORKING EQUIPMENT

LARGE-SIZE BALL BEARINGS DISCUSSED

Moscow STROITEL'NYYE I DOROZHNYYE MASHINY in Russian No 10, Oct 79
pp 29-31

[Text] This article is based on materials of the Hoesch-Rothe Erde Company of West Germany, which is one of the biggest manufacturers of large rolling bearings that are used as turntable bearings in construction and road-building machinery, municipal equipment, earth movers, hoisting and transporting gear, and also in a variety of technological equipment. In addition to its two plants in West Germany, the company has affiliates in the United States, Japan, England, France, Italy and Brazil.

The company's materials have been prepared for publication by the All-Union Scientific Research Institute of Construction and Road Machinery as part of an agreement between the company and the Ministry of Construction and Road Machinery on reciprocal publications on turntable bearings.

Over the past three decades, large ball bearings and roller bearings have become standard components in a variety of machines, and are being used in many branches of present-day machine building as the swivels between major parts of machines and equipment. In this connection, such bearings are generally called turntable bearings in the Soviet Union.

The main features of turntable bearings are relatively large diameters (up to 12 m) and masses (up to 120 metric tons), plus the fact that they are provided with engagement teeth and have an empty space near the axis that can be used to accommodate various drive components and other structural machine elements, and can also serve as a crawl space for service personnel when required.

The Rothe Erde Company was the first to produce a turntable ball bearing that has been used chiefly for connecting the swivel trucks to cars on

railroad rolling stock and heavy motor transport. The bearing is designed for transmitting axial and radial forces. The load-carrying capacity of such bearings is limited by the fact that the raceways are not tempered, and the cross sections of the rings are comparatively small because of technical-economic considerations. The balls in this bearing are installed around the entire circumference of the races without separators. This maximizes utilization of the load-carrying capacity of the untempered raceways. These ball turntables without separators cannot be used for continuous rotation, or for large angles of turn.

Another version of the single-row turntable ball bearing is distinguished by the unique design of the rings. It combines the advantages to be realized by a contact angle of 90° (maximum load-carrying capacity) and structural solidity. The balls and separating elements are installed through holes that are stopped with plugs exactly corresponding to the configuration of the raceway. This turntable bearing is used in particular where there are large axial loads. In addition, it has an anti-tipping device, but nonetheless the eccentricity of the axial load must not exceed $e = 0.8r$, where r is the radius of the circle through the centers of the balls. This turntable bearing is used mainly in hoisting and transporting gear for mining work, where large diameters are frequently needed for various reasons (passages for drops and so on), so that the resultant load nearly always remains within the range of the circle of the roller elements.

A single-row ball bearing with four-point contact is an extensively used type of turntable bearing. This bearing has a single row of roller elements, but thanks to its original design it is capable of taking axial, radial and tipping loads. The contact angle in these bearings is determined by the load combination. If axial loading predominates, the contact angle is selected at about 60° . Where radial loading predominates, the contact angle is accordingly reduced and selected at about 30° . Especially large contact angle are to be avoided in this event because ring deformation may result in misalignment and seizing. In this connection, the design with four-point contact is used mainly where moderate axial, radial and torque forces arise, for instance in the rotating tables of automatic welders, feed disks, swivel steps, etc.

A single-row turntable ball bearing with four-point contact made from specially shaped rolled stock occupies an important place in the large ball bearing industry.

The initial material for the bearing is hot-rolled section steel, which is cut, bent, and electrically butt-welded. Subsequent machining is done only on surfaces where it is necessary. The outside is generally left unmachined. The bearing is economically effective, and is distinguished by universal applicability under light loading: for transmitting purely axial or purely radial forces, and also for transmitting light combined axial, radial and torque loads (pile-driver cranes, swivel cargo manipulators on forklift trucks, rotating conveyers, stationary rotating

cranes with a permanent boom, screw conveyers, mixers, rotating tanks, and also swivel trucks under streetcars and subway rolling stock.

A two-row turntable bearing with single joint and raceways. The raceways are case-hardened by a continuous-sequence technique, using mainly induction tempering equipment.

In view of the design, this turntable bearing can be called a two-row radial-thrust bearing. The contact angles in these bearings are usually $45-90^\circ$, depending on the combination of acting radial and axial loads and the magnitude of the tipping moment. The ratio of radii of curvature of the balls and the roller races is usually 0.9-0.98.

Two-row bearings almost always use insert baffles for separators. These inserts are cylinders with diameter much smaller than that of the working balls. In the ends of the inserts are recesses to ensure reliable guiding of the balls. The diametral size of the inserts must totally preclude misalignment in the bearing.

In case emphasis is placed on ease and smoothness of rotation, the cylindrical inserts are replaced by separating balls. The diameter of the non-working balls is much less than that of the working balls. As the turntable bearing rotates, the non-working balls turn in the opposite direction due to friction against the working balls, like the idlers in a gear transmission. The spacing of the working balls when separating balls of smaller diameter are used is equal to approximately twice the diameter of a working ball, i. e. considerably greater than when cylindrical inserts are used. In this connection there is a reduction in the number of working balls, and consequently in the load-carrying capacity of the roller bearings.

In most cases the rim gear in two-row turntable bearings is made in one piece with one of the rings. Rings with external and internal gearing are used.

The teeth are generally cut in the stationary ring. As a rule, this is the ring with the upper and lower raceways for the rollers located to either side of a projection. The type of gearing is chosen depending on the purpose of the turntable bearing and the design of the part to which it is connected.

Two-row turntable roller bearings have been most extensively used in hoisting and transporting gear, excavators, tower construction cranes and so on. They are also used in many other mechanisms, devices and installations with similar loading and operating conditions. In all these cases the two-row turntable ball bearing remains a stable and reliable structure that has proved itself over decades of use.

A combined three-row turntable roller bearing is used in heavy hoisting and transporting gear, mobile cranes that require the use of turntable

bearings that can be accommodated on roadways. At the present time, cranes are being made with lifting capacity of 10^5 N, for which it is quite complicated to design turntable ball bearings that have adequate load-carrying capacity when the maximum diameter is 3000 mm.

Turntable roller bearings use separators or special baffle inserts. In both cases, close spacing of the rollers is achieved, i. e. a relatively large number of rollers is accommodated on the raceways, ensuring a correspondingly high load-carrying capacity.

The transmission of the load in three-row turntable bearings has certain peculiarities: the axial and radial forces are transmitted by different pairs of roller raceways. Just as in turntable ball bearings, the raceways are induction-tempered by a continuous-sequence method.

The clearances in these turntable ball and roller bearings are of considerable significance for workability. In connection with deformations and machining inaccuracy, including the coupled structures, the turntable bearings must have clearances within the limits of a few tenths of a millimeter. Because of their design particulars, roller bearings require greater accuracy in manufacture and assembly. Where the necessary precision is lacking, rollers in linear contact with the raceways stop and jam under conditions of appreciable clearances. The clearances in roller bearings must remain within limits of a few hundredths of a millimeter, which naturally considerably complicates requirements of accuracy for the part to be coupled. Another way to prevent jamming is to use slightly arched rollers.

The type of lubrication for the turntable bearings is chosen depending on working conditions. Grease can be used in low-speed machines. Circulating lubrication or oil mist is needed where peripheral velocities are high.

The turntable bearings are installed with bolts. It is recommended that long bolts be used with extra length reserve, which is important because of the need for pretensioning threaded joints. Pretensioning of the bolts should amount to about 70% of the yield stress of the material. Prevention of loosening is achieved not only by pretensioning the bolts, but by proper selection of locking devices. Torquing depends on the strength class of the bolts, and also on the friction in the thread and the friction of the bolt head against the supporting surface. The torques given in bolt manufacturers' tables usually apply to a lightly greased thread and a dry supporting surface. Where lubrication is absent or excessive, torquing may fluctuate wildly. This applies in particular to bolts with outside thread diameter greater than M30. To ensure the required tension, it is recommended that tension stresses be determined by measuring the longitudinal extension of the bolts.

Precision turntable bearings hold a special place in bearing production. In recent years, precision modifications of ball and roller thrust

bearings of classical types with four-point contact have been developed and introduced.

Requirements for precision rotation as determined by the conditions of application must be taken into consideration in choosing the type of bearing. Ball structures can maintain endwise and radial wobble within 0.01 mm. In the case of higher accuracy requirements, roller bearings should be used. In this case, endwise and radial wobble can be held within 0.003 mm.

Precision roller bearings can be fitted with gear teeth (mainly of class 7 precision in the DIN standard; class 6 accuracy can be maintained for small cross sections).

Rothe Erde precision bearings have given an excellent account of themselves in dividing tables, universal horizontal boring machines, turret lathes, radar antennas, irradiating equipment and many other special-purpose machines.

The high operational indices of Rothe Erde large-size bearings in both the conventional and precision modifications are due to the use of improved and cement steels, rolling, and heat-treating before rolling, and heat-treating of finished blanks. During subsequent machining and heat treatment, intermediate and acceptance testing is done with the use of modern measuring facilities and instruments. The bearings are put through different kinds of stand tests with the use of up-to-date equipment.

In addition to the bearings considered here, the company also produces turntable bearings with raceways on removable ring components of small cross section made from high-strength wire or banding.

In bearing designs with as many as six rows of rollers, the load-carrying capacity of these turntable bearings is adequate for load transmission on the heaviest modern cranes.

At the present time, the output of the company is being shipped to fifty nations around the world.

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USSR REPORT: Energy
USSR REPORT: International Economic Relations
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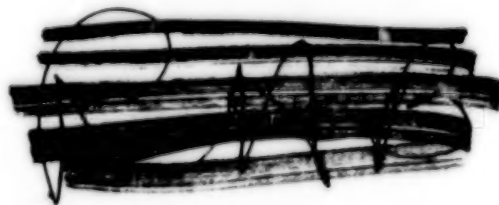
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